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THE RUSSO-GERMAN WAR AND SOVIET AGRICULTURE. . . . .

By Lazar Volin*

During the first World War food supply difficulties contributed materially to the eventual breakdown of the Russian war effort. The present Russo-German war once more turns the spotlight on this problem and hence on agricultural production. Although the statistical picture is more obscure than it was 25 years ago, it is clear that the margin provided by the large Russian export surpluses is much smaller today than in 1914. The area producing the agricultural surpluses, which was practically intact in Russian hands during 1914-1917, is today invaded or seriously threatened by the enemy. On the other hand, Nazi occupation of some of the deficit regions in northwest and central Russia, unaccompanied by mass evacuation or flight of the local population, tends if anything to alleviate the situation as far as the food supply of the rest of the Soviet Union and the Red Army is concerned. Furthermore, the collectivization of Russian agriculture insures a more solid control of the State over farm output than was the case during the first World War.

The mechanization of Russian agriculture, accompanied by the heavy wear and tear on tractors and other machinery because of inefficient handling, has made for a much greater dependence of agriculture on industry for mechanical equipment and for petroleum, which under war conditions raises difficult problems of supply.

There is little objective information regarding so crucial a factor as the morale of the peasants under war conditions - their willingness to work efficiently in the State-controlled collective farms - a problem particularly pressing in the Soviet Union during the last decade. It should not be overlooked, however, that the feeling of patriotism and resentment engendered by the Nazi invasion and policies may prevent any deterioration of and even improve the peasant morale in spite of more difficult economic conditions.

The abrupt change from Russo-German collaboration to war between the two countries has shifted the perspective from which the role of Russian agriculture has been regarded. If interest was formerly focused primarily on the question of how much grain and other supplies Hitler could obtain from Stalin, it now centers principally on the contribution of the Russian farmer to his country's own war effort and on whether Russian agriculture will provide enough food for the soldier and the civilian worker. For in Russia, as elsewhere, the army - and in a sense industry, which provides the sinews of war - marches on its stomach.

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Figure 1.—Map of the Soviet Union.

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How has Russian agriculture fared under the stresses and strains of war? Lack of reliable statistical data made it difficult to evaluate the Russian agricultural situation even before the war blackout on all information pertaining to the economic life of the country, a censorship probably more rigid in the Soviet Union than in any other belligerent country. One point, however, is fairly well established and is worth emphasizing at the outset. Soviet Russia at the beginning of the present war had a smaller export surplus of foodstuffs that could be diverted to domestic use than in 1914, when such a margin proved most helpful in meeting suddenly increased requirements occasioned by mobilization and war. Since the World War Russia has ceased to be a large exporter of food and feedstuffs, as it was before 1914. During the five years preceding the declaration of war in 1914, Russia annually exported an average of 12 million short tons of grain (wheat, rye, barley, oats, and corn), as compared with an average of about 1.1 million tons during the 5-year period 1933-34 to 1937-38.[1] Butter exports averaged 150 million pounds from 1909 to 1913, as compared with 63 million during 1933-37. It is not believed that a significant change with respect to farm exports has occurred during the past few years, even during the period of Russo-German collaboration.

The lag of aggregate grain production behind the growth of population, especially urban population, and the smaller livestock numbers since collectivization are strong evidence that the reduction in exports of foodstuffs was largely the result of diminished surpluses and not of generally increased per capita consumption, a conclusion supported by many direct observations of the Russian standard of living.

Under such conditions maintenance of Russian agricultural production at as high a level as possible and ability to move the crops into consumption channels during the war become especially urgent. Serious obstacles, however, confront the Soviet Government in these tasks, not the least of which is the progress of invasion itself.

An important distinction must be made between the different sections penetrated or menaced by the Nazi invasion - the center and northwest of the Soviet Union on the one hand, and the south on the other hand.[2] The former regions - White Russia (Belorussia), Smolensk, Kalinin, and Leningrad Provinces, and sections farther north bordering on Finland - occupied in whole or in part by the Nazis, are located in what is known as the consuming or grain-deficit zone. They are characterized by poor soils, produce mostly winter rye among food grains (although wheat growing has been on the increase), and depend on shipments from the south and east for a considerable part of their grain supply. This situation is also true of the neighboring provinces to the east and north, as yet uninvaded, such as Moscow, Ivanovsk, and Yaroslav (all industrial regions), as well as the areas farther north. The two principal cities of the Soviet Union, Moscow and Leningrad, with a combined population of over 7 million, are in this grain-consuming section, which accounts altogether for over a fifth of the total population of the Soviet Union. An important technical crop in this part

[1] For a discussion of the problem of Russian grain exports see *Foreign Agriculture*, May 1940.

[2] Leaving out of consideration the recently annexed Polish, Baltic, and Rumanian territories. Although prior to the revolution these territories, with the exception of Galicia and Bukovina, constituted parts of the former Russian Empire, they were only recently reoccupied by the Soviet Union as a result of arrangements with the Nazis and could not be considered fully integrated with the Soviet economy. These sections for the most part were speedily wrested from Soviet control by Germany at the beginning of the present Russo-German war.
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of the country is flax fiber. Smolensk, Leningrad and Kalinin Provinces, and White Russia together account for about half of the total Soviet flax-fiber acreage.

German occupation in this grain-deficit area, insofar as it is not accompanied by mass evacuation of the civilian population into other Russian regions, tends to increase grain supplies available to the rest of the Soviet Union. However, the food situation in the occupied districts themselves is likely to be extremely grave, with famine conditions probable, especially if the "scorched earth" policy of destroying crops and farm implements is applied on a large scale.

In the south the Nazis have succeeded in penetrating into the rich agricultural regions of western and southern Ukraine as far east as Dniepropetrovsk (formerly Ekaterinoslav) in the bend of the Dnieper River, and are poised for a drive toward the Caucasus. Roughly half of the Ukrainian wheat acreage lies west of the Dnieper. Moreover, the invaded western tier of provinces of Russian Ukraine - especially those of Vinnitsa and Kiev - situated in the fertile black-soil belt constitutes the principal sugar-beet-growing region of the Soviet Union, comprising nearly 40 percent of the total Soviet sugar beet acreage. A considerable number of sugar mills are located in this area. In addition, it is an important winter-wheat-growing region characterized by high per-acre yields.

Winter wheat is the leading crop in the invaded southern Ukrainian provinces of Odessa, Nikolaev, Kirovograd, and the western part of Dniepropetrovsk. Among the spring crops, barley is important in southern Ukraine, and small quantities of cotton are grown in the southernmost districts. But cotton yields are low, and loss of the crop will not appreciably affect the Russian cotton supply, which depends primarily upon production in the central Asiatic regions of the Soviet Union (Turkestan) and Transcaucasia. However, from the standpoint of the Russian food supply the loss of this territory is a serious blow, since it is a heavy grain-surplus-producing region and accounts for a large share of Russian sugar production.[3]

The area east of the Dnieper threatened by the Nazi drive toward Caucasus - Eastern and Central Ukraine, Crimea, the Don, and the Kuban regions - likewise produces surpluses of grain, particularly of wheat. The greater part of Russian grain exports, in fact, originated in these territories in the Azov-Black Sea littoral, east and west of the Dnieper. During the seasons 1930-31 to 1934-35, for which information is available, the Ukraine, North Caucasus, and Crimea shipped abroad 84 percent of all Soviet wheat exports and 98 percent of barley exports. But these sections are also an important source of supply for the deficit northern and north-central regions of Soviet Russia. In 1937, for instance, the southern surplus areas shipped north more than 5 million short tons (about 170 million bushels of 60 pounds) of all kinds of grain, or over 40 percent of the total interregional grain railway shipments recorded in the Soviet Union in that year. Crimea and Kuban are also important commercial fruit and tobacco growing regions. Kuban and Don Provinces lead in the acreage devoted to sunflower seed, the oil of which plays an important part in the Russian fat supply situation.

It is clear, then, that the deeper the German penetration in the south and southeast, the larger the gap in the food supply of the deficit northern and central

[3] For a more detailed discussion of Ukrainian agriculture see Michael, L. G., "The Soviet Ukraine – its People and Agriculture," *Foreign Agriculture*, July 1939.

zone and of the Red Army. Even mere interruption of railroad communications, making impossible the movement of grain, is a serious matter. During the first World War, too, inadequate transportation facilities accounted for a considerable part of Russian food supply difficulties. In general, however, the situation was much more favorable for the Russians in 1914-1917, when the grain-surplus-producing area remained practically intact in Russian hands.[4] On the other hand, it should not be overlooked that Nazi advance in the deficit northern and central zone tends, as indicated above, to reduce the pressure on the Russian food supply - at the cost, however, of much privation on the part of the unevacuated local population.

A grain-surplus producing region that has not been so far invaded except on the fringes is the so-called central, more correctly northern, Black Soil region, which comprises a group of provinces south of the Moscow and Smolensk Provinces and north of the Ukraine. This is primarily a winter rye-oats region, though wheat growing has increased considerably in recent years. More important and more remote from the theater of war is the neighboring middle and lower Volga basin. In this section spring wheat is the leading crop, as is winter wheat in the Ukraine and other southern regions.[5] Sunflower seed is outstanding among nongrain crops. Most of the Volga area is subject to frequent devastating droughts, which make crops uncertain. As a surplus-producing region it is therefore inferior to the more densely populated southern winter wheat belt with its higher and more stable yields. The 1941 crop outturn in the Volga area is reported by Soviet sources as good; otherwise territorial losses in the southern winter wheat belt would have been even more keenly felt.

The spring wheat belt extends into Western Siberia and Kazakstan, where the Government is attempting to expand the crop acreage. This area also produces surpluses that normally supply the deficit Asiatic regions of the Soviet Union, including the Maritime Far Eastern territory and the cotton-growing regions of Turkestan. The relatively late harvest in Siberia, with the necessity of artifically drying the grain, the frequent crop failures in the dry Kazakstan, the factor of distance, and limited transportation facilities are the drawbacks to this section as a source of supply, especially in comparison with southern European regions of the Soviet Union.

Importation of grain from the United States into Vladivostok would release a considerable quantity of Siberian grain for shipment westward into European Russia. In 1937, for instance, Western Siberia shipped out 1.3 million short tons of grain, of which some 900,000 tons (over 30 million bushels) went to the Far East. Elimination of the long rail haul through importation of grain into Vladivostok may also lighten the load on the Transsiberian Railroad. Because of the German blockade of the European Soviet ports, the Transsiberian has so far been the only safe all-weather route for shipment of imported war supplies, though it may soon have a rival in the Trans-Iranian Railroad connecting the Persian Gulf with the southern shore of the Caspian Sea. Some grain could be imported by this route into Russian Turkestan and Transcaucasia, thus relieving the deficiency of these sections, which in 1937 drew about 1.8 million tons (about 60 million bushels) of grain from Siberia, Volga, and southern European regions.

[4] The Ukraine was occupied by the Germans in 1918.

[5] The Soviet Government in recent years has been fostering increased cultivation of winter grains in the Volga and other eastern areas. This point was dealt by the writer in *Foreign Agriculture*, p. 185, May 1939.

If a shortage of grain developed in Turkestan it might necessitate a shift in production from cotton to grains, such as occurred during the World War. It is also possible that a further penetration of the Nazis into north-central European Russia, where Russian textile manufacturing industry is concentrated, will prevent the utilization of the Turkestan cotton supplies. In such an event it may be necessary for the Soviet Union to resort to imports of cotton goods and other manufactured textiles from abroad. Soviet Russia has been on an import basis for wool but is practically self-sufficient with respect to cotton.

There is little reliable information on the actual effects of the war on farm operations during the current season. The spring sowing campaign was completed before the invasion started, though with considerable delay in the northern and eastern regions because of unfavorable weather conditions. Harvest was due to begin in the south shortly after the hostilities commenced, and the situation was graphically portrayed as a race between the tanks and the tractors and combines. Although harvesting operations usually present a weak aspect of Soviet collectivized agriculture, with crop losses ranging from 10 to 20 percent and more, Soviet reports this season have been optimistic. It was claimed that to a large extent women replaced tractor drivers and combine operators who were called to the colors, and that as a result of the cooperation of women and city workers harvesting was completed in many southern districts much earlier than last year. An editorial of August 14 in *Pravda*, the official Party Organ, dealing with the agricultural situation, stated that the harvest this year was abundant and the grain outturn good everywhere, including the semiarid Volga basin and Kazakstan and the central regions of European Russia. According to other reports winter-grain yields appear to be particularly good. It was stated, however, that certain regions were too slow with their deliveries of grain to the Government. New grain storehouses are said to be established in places remote from the front.

Information on the extent to which crops in regions occupied by the Nazis have been saved or destroyed is scant and contradictory. However, most reports agree that little if any livestock and virtually no farm equipment was left undestroyed by the Russians in occupied areas, thus making harvesting of the 1941 crop and seeding of winter grain this autumn for the 1942 harvest extremely difficult. In this connection the following order was issued by the Nazi authorities in the occupied area:

> "The entire rural population is responsible for bringing in the harvest in the State farms and collective farms in each district. The form of agricultural organization will for the time being not be altered so that any distribution of land or of cattle to individuals is forbidden. The German Government will pay higher prices than those hitherto paid by the Soviet State for the crops to be delivered. Where machinery and tools for bringing in the harvest are lacking the work must be done by hand. It is in all cases inadmissible to neglect important harvesting for want of machinery. Those who participate diligently in the gathering of the harvest will not only retain their existing private property which remains exempt from taxation but will have an opportunity to increase their holdings of livestock after the introduction of an orderly administration. Where work is diligent there is no danger of food shortage."

It is significant that apparently a considerable increase in the manufacturing of farm equipment, including tractors, took place in Germany on the eve of the Russo-German war. This activity could not be wholly accounted for by domestic or export needs and may have been part of the preparation for the Russian campaign. But even if tractors were available there would still remain the serious problem of fuel shortage.

In addition to supplies from the current crop, the Soviet Government presumably possesses some stocks of grain accumulated from former crops for emergency purposes; but how large these are and how safe from the invader is not known. Climatic conditions could not be considered favorable to the building up of stocks in three out of the five years preceding the present war, and certainly less favorable than during a similar period before 1914 during which there was only one year of serious crop failure. But with deliveries of grain to the Government (once termed by Premier Stalin "the first commandment" of collective farmers) at high levels throughout the period, accumulation of stocks was probably less affected by climatic conditions than might be supposed. Moreover, in 1940 the outturn of the crop was apparently good and might have enabled the Government to replenish and even augment its stocks.

Emphasis in this discussion has been primarily on grain because of the basic character of breadstuffs in the Russian diet. Animal products, especially fats, play a much less important part in the Russian food supply; and as historical experience indicates, they are much more easily dispensed with during a crisis. Whether it will be possible to avoid a wartime reduction in livestock numbers is problematical. Although the Russian livestock industry was recovering during the past few years from the severe blow it suffered in the early thirties from collectivization, nevertheless in 1938 the numbers of all kinds of livestock except hogs were still below those of 1928. Invasion, the increased demand of the army, and generally less propitious conditions during the war are likely to increase the slaughter and mortality of livestock.

Draft power as an aspect of the livestock problem loomed large some 15 or even 10 years ago, when the chief reliance was still on horses. But this situation has changed radically during the past decade, and today horses have been relegated to a secondary place as a source of draft power in Russian agriculture. Recovery from the catastrophic reduction in the number of horses during the early years of collectivization has been slow, in spite of much stress laid in official Soviet pronouncements on the usefulness of the horse. In 1938 there were only 17.5 million horses, as compared with 34.6 million in 1929 and 35.8 million in 1916. However, nearly half a million tractors have been working in the fields during the past few years, and Russian agriculture can be said to have reached the tractor age - partly by design and partly by the accident of the destruction of horses.

Thus modern Russian agriculture is incomparably more dependent on industry, not only for supplies of mechanical equipment but also for tractor fuel, than it was a decade ago when the farmer relied chiefly on the horse and not on the internal-combustion engine to help him till the fields and gather the crops. The large-scale mechanization of Russian agriculture has made it in peacetime the principal consumer of petroleum products, supplied predominantly by the oil fields of the Caucasus. It was estimated that over 60 percent of the Russian kerosene production and about 80 percent of distillate were used in agriculture. Loss of agricultural area through German occupation tends, of course, to reduce fuel requirements; but on the other hand, military requirements for oil have undoubtedly greatly increased. Naturally a loss of the Caucasian oil fields would undoubtedly gravely affect Russian agriculture.

A question that cannot be disregarded in any consideration of the war prospects of Russian agriculture is the state of peasant morale. That the peasant's morale - that is, his willingness to work efficiently in the State-regimented collective farms - left much to be desired is clear from the almost continuous stream of measures that

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the Kremlin had to take, over a period of years, to bolster it.[6] Certainly some of the inefficiency in the operation of these farms must be attributed to this factor. Can peasant morale in the unoccupied areas be maintained under the much more trying wartime conditions, when the difficult lot of Russian peasants is bound to be aggravated, since they are likely to be required to work more and harder and to be paid less? For the Government will undoubtedly require the utmost in deliveries of agricultural products from the collective farms, whereas its ability to pay for these in terms of goods will be still more limited. Even under peace conditions a shortage of manufactured goods for general consumption was chronic in the Soviet Union. These are precisely the conditions that as a rule are largely responsible for peasant morale on the one hand and for much Government regimentation on the other.

All that can be said regarding this point on the basis of the very meager objective evidence available is that after two months of war there apparently has been no slump in peasant morale and no diminution of the grip that the centralized authority of the Kremlin has fastened on Russian agriculture. This last factor insures that the Red Army and the industrial population will have the first claim on the Russian food supply. Whether this state of affairs will continue with the prolongation of the war depends, to no small extent, on imponderables - especially on the strength of the upsurge of latent patriotism, which foreign invasions in the past have usually generated among the Russian masses irrespective of the character of the ruling regime. If such a ground-swell of patriotism occurred, it would doubtless go far in lifting the peasant and civilian morale generally to new heights of performance, despite increasing hardships and much suffering.

It has been contended that the aversion of the Russian peasant to the State-controlled collective farming into which he was driven in one way or another by Government policies during the past decade may militate against such a patriotic upswing. This thesis can be neither proved nor disproved, since the outside world knows very little of what the Russian peasant actually thinks and feels today. In this connection, however, it is worth bearing in mind that judging from statements in the Berlin press the Nazis apparently took no steps to abandon the system of collective farming in the occupied zone. One Nazi authority, discussing the German agrarian policy in this area, speaks, for instance, of a "wholesome mixture of State-owned large farms and medium-sized peasant holdings" as a desirable goal.

The motives that impel the Nazis to preserve collective farming, for the time being at any rate, are not difficult to understand, for it is probably only in this way that agricultural production in the occupied zone could be maintained and controlled to the German interest under conditions of extreme shortage of draft power, implements, livestock and labor. The Nazis perhaps also have a vivid recollection of the trying experience their predecessors had in extracting grain from the individual peasant farmers during the German occupation of the Ukraine in 1918 and the success the Bolsheviks had in this respect once the peasants were driven into collectives. By the same token, the Russian peasants' long memory may help them to realize that the Nazis have nothing better to offer, in Russia as elsewhere, than blood, sweat, and tears.

[6] This subject was discussed in detail by the writer in *Foreign Agriculture*, January 1937, May 1939, and March 1940.

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AGRICULTURAL POLICIES IN UNOCCUPIED CHINA SINCE 1937 . . . . .

By Owen L. Dawson*

A number of important agricultural promotion and control measures have been initiated by the Chinese Government for unoccupied areas since the beginning of the undeclared war between China and Japan. Special demands for food supplies to feed the increased population and the large army, besides the necessity of continuing the supply of commodities for export to supply foreign exchange, have brought to the fore the need of a sound and comprehensive agricultural program. The Chinese Government has accordingly formulated various important policies for actively promoting agriculture along many lines.

The success of this movement in unoccupied China will depend largely upon the progress and direction of political control. More measures have been initiated in unoccupied than in occupied China because of the possibility of access to rural communities and the cooperation received in the unoccupied territory. In Japanese-controlled areas little advance has been made toward recovering even pre-war levels of production as a result of the resistance and noncooperation of farmers. Any expansion of Japanese control in China is consequently expected to stop, or at least retard, agricultural improvements in general.

Measures proposed to improve agricultural conditions in China received little support from the Chinese Government before 1928. Nearly all of the numerous control measures in existence were created by local warlords to restrict the movement of farm products within the country and in some areas to convert grain fields into poppy plantations, chiefly for the purpose of collecting taxes. As soon as the National Government had consolidated its position it began to carry out plans for the reconstruction of the country. Efforts were exerted toward a general improvement of agriculture through scientific methods, with the object of rehabilitating the impoverished rural communities. Considerable progress was made along certain lines, especially in the expansion of the cotton industry; the extension of experiment stations, granaries, and cooperatives; and the building of dykes for flood-prevention and canals for irrigation.

Statistical surveys relating to agricultural economics were initiated, and agricultural education and research were pushed; loans were extended to farmers at low rates of interest and taxes were either lowered or exempted. Other improvement measures consisted of the abolition of control retarding the movement of farm products; the revision of tariff rates to protect domestic products and industries; the establishment of bureaus for the inspection and testing of commercial commodities for the standardizing and grading of export products; and the enforcement of a new set of uniform weights and measures. The increased agricultural production reported in 1936 - the largest in recent years - was at least partly a result of the agricultural improvement measures, although primarily due to favorable weather and relatively settled internal political conditions.

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MEASURES FOLLOWING THE OUTBREAK OF HOSTILITIES

Upon Japan's invasion of China agricultural progress was seriously checked, and in many cases the achievements were lost altogether. Military operations affected large numbers of the rural population and resulted in great difficulty in cultivating the land. Many factories, including those connected with agriculture (such as cotton, sugar, and flour mills), have been removed to unoccupied areas. The westward migration of this personnel and of the enormous number of refugees from the fighting zones has brought to the fore several important problems: (1) that of a supply of food and clothing for the increased civilian population behind the war fronts and the heavily expanded fighting force scattered throughout the country; (2) the necessity of obtaining foreign currency in order to meet the huge demand for imported civilian and war materials; and (3) the problem of economic counter-measures against the Japanese.

In order to solve these problems the Chinese Government found it necessary to adopt a large number of emergency measures leading to the reorganization of the agricultural structure of the country.

Reorganization of the Agricultural Structure

At the end of 1939 the Supreme National Defense Council of China created a Ministry of Agriculture and Forestry. In it are merged a number of widely scattered organizations dealing with agriculture and forestry. This is the first time that China has had a separate ministry to deal with agricultural affairs. But aside from the Ministry of Agriculture there are a number of other groups dealing with agricultural affairs. Outstanding among these are the Agricultural Credit Administration and the National Irrigation Commission.

The Agricultural Credit Administration

The Agricultural Credit Administration, under the control of the Ministry of Economic Affairs, has shown great activity in the extension of farm loans, the organization of cooperatives, and the establishment of granaries and cooperative treasuries. Most of its functions have recently been taken over by the Central Cooperative Administration, the Farmers' Bank of China, and the National Food Control Administration.

The Central Cooperative Administration

This administration, established at the end of May 1938 as an integral part of the Ministry of Economic Affairs, has jurisdiction over all cooperatives throughout the country. The setting up of industrial units under the auspices of the Chinese Industrial Cooperatives constitutes a new feature of China's cooperative scheme. These units are likewise subject to the control of this administration.

The National Agricultural Production Promotion Commission

This commission has been cooperating with various institutions in numerous agricultural projects and experiments. It grants subsidies and gives advice and recommendations to those who need them. To carry out projects it helps organize experiment stations and train skilled workers.

The Joint Office of the Four Government Banks

The four government banks (The Central Bank of China, the Bank of China, the Bank of Communications, and the Farmers' Bank of China) have a joint office in Chungking, which extends agricultural loans to the various provincial governments and other leading organizations for further distribution.

The Foreign Trade Commission

The commission is under the control of the Ministry of Finance and deals with affairs concerning the improvement and expansion of products having export value; the control, collecting, storage, transportation, and marketing of export products; and the direct participation in important branches of foreign trade, including the conclusion of barter agreements with foreign countries. The chief agricultural products involved are tung oil, tea, silk, and bristles, all of which have been put under state control.

The National Food Control Administration

This administration began to function on August 1, 1940. It has four departments - administrative, business, transportation, and sales - and a secretariat. It will adopt measures for the readjustment of the production, transportation, and distribution of foodstuffs. An outline governing the work of the Administration has already been approved by the Executive Yuan.

The Economic Blockade Committee

The committee, composed of officials of the Ministry of Economic Affairs, Ministry of Finance, and representatives of the Court Martial of the National Military Council, has lately been established for the purpose of carrying on economic warfare. With inspection posts established at all important transportation centers, the committee is expected to function: (1) to check the influx of undesirable commodities made in Japan and from Japanese-controlled areas in China; and (2) to prevent valuable raw materials from falling into Japanese hands. On August 13, 1940, a set of measures governing centralized supervision over suppression of smuggling was adopted by the Executive Yuan upon the recommendation of the Ministry of Finance.

The National Irrigation Commission

A complete plan for the organization of this committee was drafted early this year by the Ministry of Economic Affairs in conjunction with the Executive Yuan.

Others

In addition to these organizations, agricultural projects are also being carried out by various provincial governments and a network of experiment stations and cooperatives, and by branch offices of the national agricultural organizations, banks, and various committees. Twenty agricultural colleges and a large number of vocational

schools under a special Agricultural Education Committee of the Ministry of Education are assisting in agricultural improvement, research, and education.

PROGRAM FOR THE EXPANSION OF AGRICULTURAL OUTPUT

The business of the new agencies has been to promote the expansion of agricultural output, and specific plans have been drawn up for this purpose. Before discussing their nature, however, some general observations may be made concerning agricultural policies to be carried out in occupied as compared with unoccupied China.

In districts nominally occupied by the Japanese Army but virtually controlled by the Chinese soldiers or guerrillas, farming shall be conducted largely on a self-sustaining basis. Food crops naturally receive first attention, but raw materials are also to be produced to meet the requirements of the local small industries. Production of crops promoted by the Japanese to attain their economic or military ends, such as cotton or tobacco, will be strictly prohibited except for local needs, lest they find their way to the enemy. Farm loans, relief funds, and other government aids in the rehabilitation of the rural districts will still be extended, and attention will still be given to farm improvement, though on a much smaller scale.

In unoccupied China crops of staple foodstuffs, cotton, and oilseeds are to be stressed in all the provinces so as to make that part of China self-sufficient in food and clothing. Glutinous rice fields are required to be converted to ordinary rice plantations. Special crops such as tobacco and sugarcane are to be grown in regions suitable for them. Draft animals and meat animals are to be multiplied. Afforestation is to receive special attention and products having export value are to be either expanded or improved. Winter plantings, principally of wheat and rapeseed, will be encouraged, especially in southwest China, where farm lands are usually fallowed throughout the winter.

Increased production of farm products is to be effected chiefly through the introduction of scientific farming, reclamation of uncultivated land, and the shift of acreage from less important crops. Subsidiary industries are to be promoted to augment the supply of daily necessities, part of which must now be imported. Rural rehabilitation will be attained through the extension of farm loans and the establishment of various kinds of cooperatives. Granaries are to be increased to conserve food supplies. Steps are being taken to transport products from surplus to deficit areas.

Speculation and hoarding are being prohibited to keep prices within reasonable bounds, though legitimate profits are allowed in order to safeguard farmers and merchants. Anti-smuggling measures have been adopted to check the evasion of duties and taxes and to prevent the outflow of foodstuffs and raw materials into areas under Japanese influence; importation of unnecessary products is prohibited in order to preserve the wealth of the nation. Measures have also been enforced to restrict the undesirable use of farm products, especially the brewing of rice wine.

Expansion of Foodstuffs Production

Before the outbreak of hostilities the part of the country now known as unoccupied China was practically self-sufficient in foodstuffs. Some of these provinces, such as Kwangtung and Yunnan, used to import foreign rice, but the quantity was more

than offset by the surpluses in such other provinces as Anhwei, Hunan, and Kiangsi. With the influx of large numbers of people from the fighting zones, however, a radical change has taken place in the supply and demand situation, and the Chinese Government has encouraged an increase in food production there to meet the increased requirements. Since the rice harvest in 1940 was much reduced by unfavorable weather conditions and other adverse factors, the Government is even more determined to push the policy this year.

It is now reported that a program has been formulated by the Ministry of Agriculture and Forestry to increase the 1941 production of food crops in 14 provinces in unoccupied China by 2,128,385 short tons with a fund amounting to 9,500,000 yuan,[1] the details of increase being as follows:

Increases to be effected through -	*Short tons*
Utilizing open spaces	6,614
Reclaiming waste land	66,140
Extending winter plowing acreage (principally wheat)	1,223,590
Converting certain farm lands into grainfields	462,980
Introducing scientific farming:	
Propagating improved seeds	158,736
Enforcing more rigid anti-pest and anti-insect measures	54,896
Employing better-quality fertilizers	66,140
Improving farming methods	89,289
Total acreage	2,128,385

The improvement of irrigation systems is also expected to contribute to the increase of crops. Measures devised for attaining the desired results include increasing the supply of farm labor through greater utilization of the labor of peasant women and children, using soldiers and students and directing convicts to do farm work, extending loans to peasants, establishing offices to bring labor to farm lands, and increasing the stock of work cattle. In order to conserve the supply of rice the manufacture of rice-wine has been prohibited and the high polishing of rice and refined milling of wheat restricted; these measures are expected to save significant amounts of grains. Granary facilities are being improved and agricultural improvement organizations and experiment farms established in every district. Provincial and county governments are required to have technical experts to direct agricultural work.

Expansion and Improvement of Agricultural Export Products

In unoccupied China are located important producing centers for farm products of export value. Silk, however, is an exception, with the producing region in the occupied areas of Kiangsu, Chekiang, and Kwangtung. Although some export products produced in unoccupied China have shown an increase in production, it has been hard to increase exports because of transportation difficulties. The Government, however, has launched plans for the expansion and improvement of these commodities with the object of fostering agricultural trade, not only during wartime but also in the post-war years.

Much of this expansion project has been carried out through the Foreign Trade Commission. In 1938 and 1939 the Commission extended loans totaling 30 million yuan

[1] One yuan at the current official rate of exchange = about 5 cents.

for fostering tung oil, tea, silk, and animal husbandry expansion. In 1940 a total of 6,500,000 yuan was granted as subsidies for the following purposes: [2]

Subsidy	*Purpose*
1,700,000 yuan	Improvement of sericulture in interior provinces.
1,800,000 yuan	Promotion of wool output in Shensi, Kansu, Szechwan, Tsinghai, Ninghsia, and Sikang
1,200,000 yuan	Expansion of tung oil production in Szechwan, Kweichow, Hunan, Hupeh, Kwangsi, and Chekiang
1,400,000 yuan	Increase of tea production in the new Szechwan and Sikang tea-producing areas and improvement of its quality in the southeastern provinces.
400,000 yuan	Promotion of cotton, animal husbandry, leather tanning, and handicrafts.

Tung oil

The three-year economic development plan of Chekiang Province[3] launched in 1940 aims at planting 7,590 acres to tung trees in the first year, 7,590 in the second, and 15,180 in the third, and expects a production of 16,535, 19,842, and 23,149 tons of tung oil, respectively, in the three years. The present production is about 13,228 tons. Furthermore, 15 oil refinery mills will be organized during the first year, 15 more during the second, and by the end of the third there will be a total of 60 new mills.

In Szechwan, the leading tung oil producing province of China, the provincial Agricultural Improvement Institute and the National Foreign Trade Commission instituted last year a ten-year plan to increase its tung oil production from 44,092 tons annually to 110,230 tons.[4]

The Foreign Trade Commission is also working with the Ministry of Agriculture and Forestry on a five-year plan to increase tung oil production in Hupeh, Hunan, Kweichow, and Kwangsi to 71,650 tons annually.

Tea

Tea development plans have been pushed by the China National Tea Corporation, the state monopoly for this product. The Corporation is fully entrusted with the production, manufacture, collection, transportation, and export of tea. Besides the six well-known producing centers - Anhwei, Kiangsi, Hunan, Hupeh, Chekiang, and Fukien - tea is now grown in Yunnan, which has successfully cultivated the famous Keemun variety. The Corporation has established three tea factories in Yunnan and one each in Szechwan and Kweichow. An experiment factory has been established at Fohai, Yunnan, where tea has been found comparable with the famous black tea of India. Another experiment factory has been set up at Shunning and a third at Iliang, on the Yunnan-French Indochina Railway. In June 1939 the Corporation chose Kwanhsien, Szechwan, as the base of a province-wide tea development program.

[2] *The Chinese Economic and Statistical Review* (China Institute of Economic and Statistical Research) p. 166, Shanghai, July 1940.

[3] *China News and Views Digest*, Shanghai. July 3, 1940.

[4] *North China Daily News*, April 2, 1941.

It is expected that further development of the tea industry in southwest China will lead to increased production this year. The average annual production during the past two years is estimated at 900 million pounds. At present only from 10 to 15 percent is exported and the rest consumed domestically.

Silk

The Ministry of Economics has directed its attention to sericultural development projects, among which the following may be mentioned as having already assumed some degree of organization:

(1) A silk company in Szechwan with a capital of 3 million yuan subscribed jointly by government and private interests;

(2) An extensive sericultural model village established by the Yunnan Silk Company, capitalized at 8 million yuan;

(3) A silk experiment station established by the Sining Company of Sikang;

(4) Four stations for the breeding and raising of wild silkworms set up by the Kweichow Enterprises Corporation; and

(5) A silk cocoon department established by the Oil, Tea, Silk, and Cotton Administration of the Chekiang Province.

The three-year plan of Chekiang also provides for silk expansion. During the first year 304 acres of uncultivated land will be used for planting mulberry trees; in the second year 1,518 acres; and in the third 6,072. Meanwhile scientific methods will be introduced in the 53,130 acres now planted to mulberry trees in order to increase production. In the first year 500,000 sheets of improved silkworm eggs will be produced for distribution, in the second year 1,000,000, and in the third 2,000,000. Under this arrangement Chekiang expects the production of 59,526 tons of cocoons in the first year, and with 1,600 new silk-reeling machines the province will produce 7,000 bales of raw silk. The estimates for the second year are 119,052 tons of cocoons, 2,000 new silk-reeling machines, and 14,000 bales of raw silk; those for the third year are 238,104 tons of cocoons, 4,000 machines, and 28,000 bales of raw silk.

Similar work, though differing in scope, has been undertaken in a number of other unoccupied provinces. In Yunnan, for instance, 25 million yuan was invested in 1939 in the development of a silk village project occupying 12,903 acres of highland.[5] This project is part of a general scheme to revive the silk industry in unoccupied China in order to help offset the loss of Kiangsu and Chekiang, two silk-producing provinces on the eastern coast. Through organized efforts increasing numbers of war refugees from the coastal provinces, with experience in raising silkworms, have settled in the new village. The ultimate object is to grow mulberry trees on 9,100 acres of land, and to secure a total cocoon production of as many tons. It has also been planned to erect silk-reeling plants to turn out 4,960 tons of raw silk a year. According to a recent announcement by the reconstruction commissioner of Yunnan 40 million mulberry seedlings were planted in this province during July-December 1940. The commissioner adds that government and provincial banks are investing money for installing modern machinery for the manufacture of silk.

[5] *China at War*, Chungking, March 1941.

Expansion of Other Farm Crops

Other products for which expansion of production has been undertaken are cotton, tobacco, rape, and some special products.

Cotton

Although cotton production is restricted in areas nominally occupied by the Japanese Army but virtually controlled by Chinese forces, its cultivation is being promoted in unoccupied China, especially in the southwest. A three-year Plan of Cotton Production has been launched by the Ministry of War to promote the production of this important war material in six provinces: Szechwan, Sikang, Kweichow, Yunnan, Hunan, and Kwangtung. The Ministry has taken vigorous steps to distribute the superior Delfos cotton seed for propagation purposes to all agricultural organizations under the provincial governments. Increased inducement is being offered the farmers to sow improved cotton seed. Other plans for the promotion of this product are as follows:

A three-year cotton plantation plan was announced in April 1940 to be launched in Kansu Province in the spring of that year, whereby 75,900 acres of land would be used for cotton planting by the end of the third year, thus making the province self-sufficient in cotton supplies.

The three-year economic development scheme for Chekiang includes a plan for the expansion of its present cotton acreage by 37,950 acres. Loans will also be extended to farmers for the purchase of a number of spinning and weaving machines and for the establishment of a few small cotton mills.

In the western part of Hunnan the provincial authorities were reported in March 1940 to be launching a cotton planting program. In one *haien* (county) alone the area of cooperative cotton farms has exceeded 6,527 acres. The working stations of the Provincial Farm Improvement Bureau have purchased a good grade of cotton seed for distribution among the farmers. In addition to the existing cotton farms 30,360 acres more will be devoted to cotton growing. The provinces of Yunnan, Kweichow, and Sikang also plan to produce small quantities of cotton.

Tobacco

Tobacco is produced in all provinces of China. Cultivation of the improved types for manufacturing cigarettes, however, has so far been concentrated in Shantung, Anhwei, and Honan. Although these provinces are under the nominal occupation of the Japanese Army, many districts are now areas of Chinese guerrilla activity, and by order of the Central Government food crops have to a considerable extent replaced tobacco there. Because of the much smaller amount of tobacco supplies now available to the unoccupied areas, together with the existing ban on imported tobacco, plans for the promotion of improved leaf have been launched, especially in Szechwan.

In Szechwan a three-year plan has been mapped out by the Szechwan Tobacco Experiment Station. It is expected that in 1943 approximately 95,000 acres of the province's 300,000 acres of tobacco fields will be devoted to the growth of adapted American and improved Chinese leaf. The 95,000 acres is expected to yield about 110 million pounds of leaf.

Rape

With a view to meeting the greater demand for vegetable oils to be substituted for imported oils for cooking, lighting, and other purposes, the cultivation of rape has been promoted in unoccupied China. Production of this crop, as well as of wheat, has been increased materially through a plan to expand winter sowings. In the winter of 1939-40 Szechwan Province added 136,620 acres of rape and Kweichow 54,648. Increases in acreage were registered in most of the other provinces also, and production was expanded correspondingly.

Other crops

Sugarcane cultivation is being encouraged in Szechwan, where production is reported to have shown a significant increase since the outbreak of hostilities. Some sugar refineries have been moved there from Fukien and Kwangtung. In addition, in the outline of economic reconstruction for Szechwan it is provided that attention be paid to the increase of production and the improvement of quality of *potatoes, vegetable seeds,* and *medical herbs.*

The National Agricultural Promotion Commission is reported to have taken an active interest in the improvement of *fruits* such as Szechwan's oranges. In 1940 the Szechwan Provincial Agricultural Improvement Institute raised 92,066 orange seedlings, 14,200 pumelo, 3,400 Eureka lemon, 960 peach, and 3,830 Kiangtsin orange seedlings, and distributed them in the Chengtu area for planting.

Although definite information is not available, it is believed that numerous *oilseed crops* besides rape are being promoted in suitable regions. *Sweetpotato* production is also being fostered in certain provinces, not only for use as food but also for the manufacture of alcohol. The production of medical herbs has also been promoted in provinces other than Szechwan, especially in Yunnan, Kwangsi, and Kweichow.

Expansion of Livestock

According to an announcement by the Minister of Agriculture and Forestry in May 1940, one of the first tasks of the new ministry will be the establishment of large experimental animal husbandry stations in both northwest and southwest China; special emphasis will be given to raising oxen. Experts have been invited to disseminate veterinary knowledge in the rural communities. In March 1941 the promotion of animal husbandry and veterinary surgery throughout the country was proposed and adopted in the First National Agricultural and Afforestation Administrative Conference held in Chungking. Although details of the proposal are not yet available, a brief review of previous plans and achievements may furnish an understanding of the measures so far undertaken:

In 1939-40, through the financial aid of the National Agricultural Production Promotion Commission of the Executive Yuan, 50,000 work cattle and 400,000 sheep were added in Shensi, Kansu, and Ninghsia. In 1939 the Farmers' Bank of China loaned 18,500,000 yuan to help the farmers in purchasing oxen, seed, and farm implements and in promoting improved farming methods. In Sinkiang alone the Government has invested more than 2 million yuan in animal husbandry. Among the animals raised there are horses, camels, oxen, donkeys, sheep, goats, hogs, and poultry.

One of the five principal activities of the Szechwan Provincial Agricultural Improvement Institution is the promotion of animal husbandry. Cattle-raising at Santai and Sanchieh under the encouragement of the provincial government increased the income of the farmers there by more than 500,000 yuan. The Joint Administrative Office of the Four Government Banks has started negotiations with the Institution for the establishment of a modern sheep ranch in the western part of the province, by which sheep numbers are expected to be increased to 200,000 in five years and wool production to 6,614 tons.

GENERAL AGRICULTURAL IMPROVEMENT MEASURES

Toward carrying out the foregoing agricultural projects various plans have been made and large sums of money appropriated. The chief features of these plans include the introduction of scientific farming, land reclamation, irrigation and other hydraulic works, and rural rehabilitation.

Introduction of Scientific Farming

For an increase of production and improvement in quality of farm products the introduction of scientific farming is highly imperative. During recent years the National Agricultural Research Bureau has taken the lead in this work.

Rice

Rice breeding has been carried on by the National Agricultural Research Bureau in Chengtu, Szechwan Province; Liuchow, Kwangsi Province; and Chihkiang, Hunan Province. According to results obtained in Liuchow the different varieties of medium rice introduced from the Yangtze Valley have all been found well suited to the Kwangsi soil. Such strains as Shanghaotsao, Kiukiang Nos. 292 and 1257, Chichaoshan, and Nantohao may be grouped together as the early rice variety, which yields more abundant harvests and rice of a better quality than local Kwangsi strains of Paijihtsao and Paoyatsao. In addition to seed-testing work throughout the provinces of Hunan, Kwangsi, Szechwan, and Yunnan, the Bureau has pushed the propagation work of selected varieties of seeds, especially in Hunan.

Wheat

With regard to wheat production the Bureau is carrying on the work of seed breeding, propagation of selected and improved varieties of seed, and wheat hybridization testing experiments. According to the results of the adaptability experiments obtained at Changsha, Hunan Province, the seed selection No. 2905 of the College of Agriculture and Forestry of the University of Nanking topped the list as the best and most productive. Seed No. 61 of Nansuchow, Anhwei Province, and the blue-awned wheat of the northwest ranked a close second, and the small red-awned wheat of Hsuchow and No. 124 of Kaifong ranked third in both quality and production. Interesting results were also obtained from the wheat hybridization testing experiment. Most noteworthy has been the fact that seed selection No. 207/155 possesses resistance against yellow rust and the power of immunity is more highly developed in its offspring. Selected

and improved strains of wheat were distributed by the Bureau throughout 42 counties in Kwangsi.

Tobacco

In Kweichow the Bureau tried the planting of eight different varieties of tobacco. Of these, three local varieties - the American Variety grown by the Department of Sansui, the Chingchen, and the Langtai - yielded the best results. The variety "Agriculture of National Central University" ranked second, and Luotien, Chichin, and Tuyun third. The first-rate Sansui, Chichin, and Langtai varieties compare in quality with the tobacco grown in Shantung.

Cotton

An outstanding feature of the Bureau's 1939 program for increasing and improving Chinese cotton production was the propagation of the American variety Delfos over an area of 10,000 acres in the province of Szechwan. For this purpose 3,307 tons of the Delfos seed were brought from Honan Province. Improved varieties of cotton were also grown on 5,000 acres in Kweichow and 3,000 acres in Yunnan. It was discovered that the Egyptian cotton grown in Yunnan with a staple length of 1½ inches is suitable for spinning 42's yarn.

Fertilizers

In China, especially in the western half, modern fertilizers are seldom used except for very profitable crops. With a view to increasing production, the Chinese Government has been extending large loans to farmers for purchasing fertilizers and conducting research concerning the enriching of different types of soil through various kinds of chemical fertilizers and the propagating of green manure crops.

In Szechwan the Provincial Agricultural Improvement Institute has increased production of fertilizers through establishment of six factories which turned out 285,175 catties (1 catty equals 1-1/3 pounds) of bone powder, 30 catties of which, applied to .1518 acre of rice fields, increased production by 60 catties.

The price of imported fertilizers has greatly increased since the outbreak of hostilities in Europe. It was reported in March 1940 that the price for the two-picul bag of fertilizers (1 picul = 132.28 pounds) had increased from 50 to 120 yuan. During 1939 over 66,140 tons of fertilizers were imported.

Land Reclamation

Land reclamation in China offers some possibility of increasing supplies of farm products. As a rule the provinces in the eastern half of the country are better cultivated than those further from the coast, which have more room for further development. In Kweichow, one of the latter provinces, out of a total of 7,590,000 acres of arable land, no less than 3,036,000 are awaiting reclamation. With a view to settling a large number of the war-affected population, as well as to expanding agricultural production, the Chinese Government has been pushing a large-scale land reclamation campaign.

In Szechwan incomplete statistics indicate that 189,750 acres of land have been cultivated by 100,000 settlers and their families. The western part of the province, comprising 51,120 square miles, is reported to have a population of only 239 persons per square mile. It was reported in May 1940 that a comprehensive plan had been formulated to reclaim the uncultivated land in this region. Plans are under way for establishing a land reclamation bank and for issuing 100-million-yuan land reclamation bonds. In Sikang it has been decided to establish a national reclamation region in an area of 16,400 square miles, which possesses rich soil, fertile pastures, and huge forests.

In Yunnan an extensive tract of highland of about 12,903 acres is under reclamation by silk producers. In Kwangsi from 1926 to 1938 the area of uncultivated land was reduced from 112,332 acres to 24,288 and a large part of the uncultivated area is being reclaimed by refugees from Kiangsu, Anhwei, Honan, and Hupeh. In Hunan, some 14,360 acres of uncultivated soil were utilized in 1939 and 4.5 million more still await development.

Rural Rehabilitation

The rehabilitation of the rural population, which is said to constitute more than 80 percent of the total, is believed to be especially necessary at this juncture, when war is in progress.

Financial aid

In the 8-month period between June 1939 and February 1940 the Chinese Government loaned to farmers in 20 provinces in China a total of 151,324,481.46 yuan. In addition a total of 400 million yuan was loaned in 1940. This sum is the largest single amount ever invested by the Chinese Government in any productive enterprise either before or during the war. Besides these loans government organizations are reported to have decided to invest jointly 10 million yuan for the promotion of farming in the inland provinces.

The total amount to be expended for agricultural loans this year has not yet been announced; however, it was recently reported that the Joint Administrative Office of the Four Government Banks is granting 50 million yuan for farm loans to Kwangtung, Fukien, Chekiang, Kiangsu, and Shantung. In addition, in order to relieve the financial situation of the rural communities the Farmers' Bank of China has established rural cooperative treasuries in various localities. In November 1939 it was reported that more than 200 such treasuries had been established in 213 counties in 11 provinces, with an aggregate capital of 36,300,000 yuan.

Cooperatives

The organization of rural cooperatives has made great progress in China because of the popularity gained through the extension of loans to farmers. To concentrate control over these cooperatives the Central Cooperative Administration was established at the end of May 1938. At present nearly every province has a Cooperative Administration.

It was reported on November 7, 1939, that China had over 110,000 cooperatives, including those in the occupied areas, of which 99 percent were credit cooperatives. Since the establishment of the Central Cooperative Administration a concerted plan has been mapped out for a better balanced development in the future. A recent report states that in 16 provinces of China there are now 103,444 cooperatives with a total of 5,663,683 members and a total capital of 20,979,951 yuan.

Besides the rural cooperatives a movement was started in April 1938 to organize Chinese Industrial Cooperatives for fostering the subsidiary industries in the rural districts. Recent statistics indicate that about 200,000 people are being supported by these cooperatives. This number, however, does not include the 25,000 members of the 2,200 societies spread all over the country. The total production of the cooperatives is said to have reached 12 million yuan a month in value at present.

Granaries

In the old days nearly every county of China had a barn in which grain purchased by the Government was stored against a famine. The introduction of the modern granary system is a matter of recent years. By the fall of 1939 the Ministry of Economic Affairs had already established 92 such granaries, with a total capacity of 123,867 tons, and 27 others were being erected. Besides these it was reported in the winter of 1940 that 656 auxiliary granaries had been established with a total storage capacity of 39,023 tons.

Agricultural education

China now has 20 agricultural colleges teaching advanced scientific farming. Directing the nation's agricultural educational policy is a special agricultural education committee under the Ministry of Education. The guiding principle of China's agricultural education policy is adaptation to local conditions, insofar as possible. For instance, the colleges in the northwest will emphasize animal husbandry; those in Szechwan and Sikang silk, tea, and other crops; and those in other parts will pay special attention to grains.

Distributed all over unoccupied China are also numerous agricultural vocational schools, whose function is to teach farm youths improved methods of farming. Better cultural methods are also taught by cooperatives and experiment stations, and pamphlets for that purpose are distributed among the producers.

CONTROL MEASURES

Japan's war against China resulted in severe dislocations of agricultural production, distribution, consumption, and prices. Speculation and hoarding of foodstuffs and other daily necessities have become a common practice. Efforts have been made by the Japanese to secure available supplies and to promote certain crops in which they are especially interested. At the same time smuggling has been carried on by the Chinese to evade the existing bans and the taxes. Meanwhile, foreign currency had to be secured by the Chinese Government through exports. To cope with these conditions the Chinese Government enacted a number of control measures.

Food Control

Shortly after the outbreak of hostilities, on August 31, 1937, the National Government promulgated the provisional regulations governing punishment for the crime of supplying the enemy with foodstuffs. On September 8, 1937, a set of Wartime Foodstuffs Control Regulations was promulgated by the Executive Yuan. On the whole, with the good harvests reaped in 1938 and 1939 in most of the unoccupied areas, little uneasiness was felt at that time about the supply of food. In the early part of 1940, however, the poor rice crop prospects, together with the large quantities desired from China by the Japanese, brought the fear of a serious shortage. Prices advanced rapidly, and speculation and hoarding began. To cope with this situation a National Food Control Administration was inaugurated in Chungking on August 1, 1940, and provincial and district food control administrations were established soon afterward. The important functions of the administration are as follows: Collection of statistical data relating to the production, marketing, gain, or loss of foodstuffs in different places, to the quality and quantity of various foodstuffs, to processes for the improvement in food production, and to the food market and the stabilization of food prices in different places; collection of other related materials to facilitate the work of food research; and investigation and registration of the production, storage, transportation, and marketing of foodstuffs.

Other food control measures that have already been enforced are the conversion of farm lands now planted to glutinous rice and other crops of less importance into fields of ordinary rice and other staple food crops; the prohibition of sugar manufacture with rice and of wine brewing from grains; and the restriction of the hulling of rice and wheat. Steps have also been taken to purchase rice from surplus regions and sell it to deficit areas; to fix maximum prices for grains; to exempt the import duty on foreign rice; to increase winter sowings on fields usually fallowed throughout the winter and those formerly planted to poppies; and to expand the acreage of rice and other food crops through the reclamation of virgin land and the introduction of scientific farming, including irrigation and seed selection.

Export Control

Certain commodities have been placed under state monopoly for the purpose of exporting them to fulfil barter agreements entered into with foreign powers, or to secure foreign currency. Among these commodities are tea, tung oil, wool, hog's bristles, and native raw silk and cocoons.

The centralized control of these products has been entrusted to the Foreign Trade Commission of the Ministry of Finance. It should be remarked that the Commission was originally established to foster the export trade of China and secure the foreign currency proceeds thus obtained. Early in 1938 several branch offices were set up by the Commission in Hongkong, Shanghai, Chungking, and other places to take charge of the collecting, storage, transportation, and marketing of export products.

When the barter agreement with the Soviet Union was approved in February 1938 its implementation was entrusted to the Foreign Trade Commission. The Commission was given a foundation fund of about 30 million yuan by the national treasury to purchase and collect goods specified in the agreement. Tea was the principal commodity and

wool the second. In December 1938, when an agreement was signed between China and America for a loan secured on tung oil, implementation of this agreement was again entrusted to the Commission. A special trading corporation was organized by the Commission to collect and deliver the goods called for.

Bristles is another commodity over which the Commission has assumed control. It bought the Chungking Bristle Factory and greatly increased its capital. The purpose of this move was to expand the dressing capacity of the plant so that the entire crop of white bristles from Szechwan, estimated at 231 tons a year, could be processed there. Native raw silk and cocoons have similarly been placed under control. In the past two years the Commission has been chiefly concerned with the extension of loans to silk producers and with the purchase and movement of accumulated stocks of silk and cocoons.

Besides those products put under state control, the exportation of which is taken care of by the Foreign Trade Commission, a number of articles for export are subject to the foreign exchange control. In March 1940 the Government ordered that export articles, the foreign exchange proceeds of which must be sold to government banks, are limited to 14 groups of commodities, including the agricultural items of egg products, feathers, intestines, hides, furs, nutgalls, herbal medicines, wax, and cotton. These commodities may be exported free of duty upon evidence that the foreign exchange proceeds have been surrendered. The export of other articles has also been encouraged. In June 1939 the Ministry of Finance permitted the free export of 34 groups of articles produced in the interior, having little or no effect on the wartime resources of the nation.

Other policies relating to foreign trade have been the banning of exports of foodstuffs and other needed products to ensure an adequate supply to meet the demands of the nation; the prohibition of shipments of goods from Japan and the occupied areas in China in order to prevent the outflow of Chinese capital into the hands of the enemy; and the restriction of exports to occupied territory of all materials needed by the enemy, including foodstuffs, cotton, tobacco, vegetable oils and oilseeds, waste silk, wool, and bristles.

Import Control

On July 1, 1939, the Government as a war economy measure forbade the importation into China of some 234 luxury articles. The agricultural products involved are silk and manufactures thereof, certain wool manufactures, numerous kinds of marine products, fruits, eggs, tea, peanuts, certain animal products, sugar, vegetables, wines, higher grades of cigarettes, cigars and tobacco, and certain kinds of timber, bamboo, and rattan. The prohibition also applies to interport transshipment. Special licenses for the importation and transportation of articles like sugar may be granted upon application to the Ministry of Finance.

Imports other than luxuries and not within the prohibition list, such as Japanese goods, were subject to exchange regulations. From June 1938 acceptance of applications for import exchange was restricted to the importation of commodities approved by the Government.

In September 1939 an order was given to levy only two-thirds of the prevailing import duties on all goods not prohibited by the Government. Goods which enjoyed

this privilege included articles vital to the subsistence of the people, such as rice, wheat, and cotton cloth. Rice for the provinces of Kwangtung, Yunnan, Chekiang, and Fukien was put on the free list in the second year of the undeclared war because of the difficulty of shipping into those provinces from other parts of China. Between May and August of 1940 an order was given to exempt foreign rice from all import duties.

SUMMARY

Because of the short history of the agricultural improvement institutions and the inadequate supply of trained workers for the vast projects necessary to cope with the present situation, results of the program cannot yet be said to have affected total production to an appreciable extent. However, efforts to expand production and improve marketing arrangements have helped to keep agriculture from deteriorating as it might have under the pressure of wartime conditions. Despite the shortage of farm labor and of fertilizers, the total production of leading farm crops in unoccupied areas during 1938 and 1939 was maintained at a relatively high level. The decreased production in 1940 was largely a result of unfavorable weather conditions and has caused a redoubling of efforts to utilize agricultural resources in the most efficient manner, since food supplies are insufficient and imports necessary to supply normal needs will be a drain on the financial structure of the country.

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FOOD RATIONING IN GERMANY . . . . .

By J. H. Richter*

A comparison of wartime food rations in Germany with pre-war consumption is fraught with difficulties; yet it seems possible to make reasonably reliable estimates of the extent of the restrictions imposed from the outbreak of war. Although the general food situation so far has been considerably better than during the World War, the present reduction in civilian consumption of individual foods is substantial. The rationing system clearly favors large-size families and, above all, those consumer groups that most directly sustain the military, industrial, and agricultural war effort. The total energy value of wartime food consumption by the civilian population may be estimated at slightly below 90 percent of the pre-war level; for important consumer groups it may not differ greatly from the pre-war standard. The supply of carbohydrates is fairly ample. As a result of the shifts in the composition of the diet, however, the proportions of fats and proteins and of food vitamins and mineral salts are generally reduced. In connection with this reduction in supplies it is well to remember that the manifold strains of war increase rather than reduce the physiological requirements of the human body.

FOOD CONSUMPTION IN THE FIRST TWO YEARS OF WAR

Available evidence appears to indicate that although aggregate food consumption in Germany during several years before 1939 was below what it would have been without regulation, it was not substantially below earlier periods of high economic activity. With regard to wartime consumption of the various kinds of food, it is somewhat difficult to estimate by how much the supply to consumers has been restricted compared with the pre-war level. It is not known, for example, what percentages of the population fall into the various consumer groups, whose rations differ considerably from each other. Not even in the case of children is it possible to make exact estimates, though population statistics giving age distributions are available. It is not known how many children in each age group belong to the farm population, whose consumption and allowances appear to differ from that of the urban groups.

Yet it seems possible to devise a procedure sufficiently inclusive to permit some generalizing statements as to wartime food consumption in terms of the pre-war level. Some methodological comment regarding these estimates will be found in the following section of this article. It should be borne in mind that no attempt has been made to estimate consumption by income groups, and that significant differences therefore appear to be buried in the catch-all of the "normal consumer" denomination, which in pre-war years included over 50 percent and in wartime may be estimated at over 40 percent of the total population.

* Office of Foreign Agricultural Relations.

TABLE 1.—*Germany: Weekly food rations per person, August 1939-September 1941*[1]

FOODSTUFF	NORMAL CONSUMERS	LONG & NIGHT WORKERS	HEAVY WORKERS	EXTRA-HEAVY WORKERS	CHILDREN 0-3 YEARS	CHILDREN 3-6 YEARS	CHILDREN 6-10 YEARS	CHILDREN 10-14 YEARS
	Grams	*Grams*	*Grams*	*Grams*	*Grams*	*Grams*	*Grams*	*Grams*
Bread, flour, and cereals:								
Bread and flour in terms of bread	[2] 2,250	2,850	3,650	4,650	1,100	1,100	1,700	2,600
Bread and flour in terms of flour	[2] [3] 1,688	[3] 2,138	[3] 2,738	[3] 3,488	825	825	1,275	1,950
Farinaceous foods	75-150	75-150	75-150	75-150	275	275	75-150	75-150
Total, in terms of flour[4]	1,763-1,838	2,213-2,288	2,813-2,888	3,563-3,638	1,100	1,100	1,350-1,425	2,025-2,100
Sugar[5] (to April 1940)	250	250	250	250	250	250	250	250
Sugar[5] (from April 1940)	225	225	225	225	225	225	[6] 225	[6] 225
Marmalade or sugar (to May 5, 1940)	100	100	100	100	100	100	[6] 150	[6] 150
Marmalade or sugar (from May 5, 1940)	150	150	150	150	150	150	[6] 150	[6] 150
Marmalade or sugar (to May 5, 1940)	40	40	40	40	40	40	40	40
Marmalade or sugar (from May 5, 1940)	112.5	112.5	112.5	112.5	[8] 112.5	[8] 112.5	[8] 112.5	[8] 112.5
Artificial honey	(7)	(7)	(7)	(7)	[8] 31.3	[8] 31.3	[8] 31.3	[8] 31.3
Meat[9] (Aug. 29, 1939-June 1, 1941)	500	600	1,000	1,200	250	250	500	500
Meat[9] (from June 2, 1941)	400	600	800	1,000	250	250	400	400
Fats and oils	[10] 268.7	[10] 288.8	[10] 393.8	[10] 737.5	[10] 125	[10] 187.5	[10] 259.4	[10] 259.4
Cheese	[10] 62.5	[10] 62.5	[10] 62.5	[10] 62.5	[10] 62.5	[10] 62.5	[10] 62.5	[10] 62.5
Curds[11]	31.25	31.25	31.25	31.25				
Whole milk	(12)	(12)	(12)	(12)	5,250	3,500	1,750	1,750
Skimmed milk	(13)	(13)	(13)	(13)	-	-	-	-
Eggs	(14)	(14)	(14)	(14)	(14)	(14)	(14)	(14)

[1] 28.35 grams = 1 ounce.

[2] 2,600 grams (bread) or 1,950 (flour) for young people from 14 to 20 years.

[3] Cereals, rice, alimentary pastes, sago, grits, cream of wheat, maizena, and other products with a grain base. The official German ration of so-called *Nährmittel* is included in one item together with legumes. For purposes of comparison, however, only products with a grain base have been included in the quantities given above.

[4] There is a flour supplement for south Germany of 187.5 grams per week; it is available to about 20 percent of the total civilian population of the Old Reich. The supplement increases the average civilian ration by about 2 percent.

[5] Special allowances made for jam-making in the season.

[6] Plus an extra allotment of 50, not convertible into sugar.

[7] 125 grams every 3 months.

[8] Plus 125 grams every 3 months.

[9] Rations include 20 percent bone.

[10] At times this ration was only 46.88 grams per week; for instance, from December 1939 to February 1940; in April 1940; and some later periods. For some periods the ration was replaced by 170 grams of condensed milk, or consumers were given the choice of taking 125 grams of curds in place of 62.5 grams of cheese.

[11] Equals cottage cheese. Available without ration cards from July to November 18, 1940.

[12] Wartime rations of whole milk, as a rule, are reserved for children. However, expectant and nursing mothers, invalids, sick people, and workers in certain occupations detrimental to health (chemical industries) upon application may receive 3½ liters (about 3,500 grams) of whole milk per week.

[13] Skimmed milk is said to be freely available to all types of consumers; but the supply is clearly limited.

[14] Allowances apparently varying, depending on the season. From one to two eggs per person per week seems to have been distributed to the urban population in the first two years of war.

Compiled from official sources.

The data and information available at present do not suffice for separate analysis of food consumption in such territories as Bohemia-Moravia or Poland, or by such underprivileged groups as Jews and prisoners of war. The study has been confined to the "Old Reich" - Germany within 1937 boundaries - and to the main body of the population. Relative food consumption in Austria and the Sudetenland compared with that of pre-war years appears to be much the same as in the Old Reich. Relative allowances of some foods in Bohemia-Moravia are smaller, and the food situation there, in the urban centers at least, is less satisfactory than in Germany proper. An extremely unfavorable situation is generally known to exist in Poland, where the Polish and Jewish populations are subjected to serious privations.

As to the Jewish population in Germany proper, it appears that their theoretical rations of the principal foodstuffs are the same as those of the rest of the populace, but administrative practice is discriminating against them in a number of ways. Thus, for example, it appears to be a rather widespread custom to specify certain hours during which the Jewish population must do its shopping. These are usually the later hours of the afternoon, when the day's supply of the more desirable grades and qualities of food is reduced or exhausted and perhaps even the physical ration not fully available. It is, furthermore, a practice of the authorities to exclude the Jewish population from special food allowances made at intervals, notably of fresh fruit, canned fruit, and canned vegetables.

Bread, flour, and cereals

Consumption of bread and flour by the great masses of the German people in the first two years of war was hardly below the pre-war standard. As a matter of fact, it may even have been substantially above the pre-war level for certain categories of workers and in families with children. The average for all civilian consumers (table 1, Appendix) was about 95 percent of the pre-war level. The lower estimated relative consumption by farmers may perhaps be explained by the ease with which, in some parts of the country, this group can grow and consume additional supplies of potatoes. The quality of the bread still seems to be fairly good.[1]

According to a German military research institute *(the Ernährungswissenschaftliche Forschungsstelle)* total consumption of bread, flour, and farinaceous foods in the first year of the present war was 8 percent above that of the last pre-war year (presumably 1938).[2] This estimate probably includes consumption by the armed forces, but excludes consumption by prisoners of war. The corresponding figures in table 1, Appendix, p. 437, show an increase by only 1 percent in average per capita consumption. However, if an increase in the population between 1938 and 1939-40 by 1 percent is allowed for, and if, moreover, the difference between 1938 consumption and the average of 1936 and 1937 (the basis for pre-war figures of this study) is properly taken account of, the adjusted data of table 1, Appendix, show a wartime increase in consumption by 6.7 percent, as compared with the 8 percent of the *Ernährungswissenschaftliche*

[1] This is not surprising, since wheat and rye supplies, of which a large reserve had been accumulated before the outbreak of war, have so far been ample. Admixture of potato flour is on a moderate scale. Other grains are used for feed rather than to replace the more plentiful wheat and rye.

[2] According to preliminary results of a study made by this institute, reported in "Volksernährung," *Nationalsozialistische Landpost,* No. 7. Feb. 14, 1941.

Forschungsstelle.[3] If the estimate by the *Forschungsstelle* refers to per capita data - that is, data from which the changes in population numbers have been eliminated - the comparable percentage would be a 5.6 percent increase, as compared with their 8 percent.

Potatoes, vegetables, and fruit

German per capita consumption of potatoes for food before the war is estimated to have averaged from 3,300 to 3,500 grams (7½ to 7¾ pounds) per week during 1934-1938. The *Forschungsstelle* estimates the increase of consumption in the first year of war at 14.3 percent, compared to 1938, or about 15 percent above the average for 1934-1938. This seems the minimum increase likely to have taken place. Other vegetables, it is claimed by the *Forschungsstelle,* have also been consumed in considerably larger than pre-war quantities; however, it is doubtful whether this statement can be correct. All available evidence seems to indicate a considerable shortage of vegetables, fresh, canned, and dried, in the first year of war, though there is no doubt that the supply in the second war year, as a result of large domestic plantings and imports from Italy and the Netherlands, was greatly improved.

Fruit supplies in the winter of 1940-41 were very short, largely because of the failure of the apple crop in 1940, following a bumper crop in 1939. Since many trees - some reports speak of 18 percent of the German orchards - were killed by frost in the severe winter of 1939-40, the outlook for fruit supplies from domestic production is not good. Allocation of from 1 to 2 pounds of apples per month in the winter of 1940-41 was largely limited to children and adolescents.

Sugar

Ration allowances of sugar and marmalade in terms of sugar during the first two years of war ranged from 290 to 340 grams (10 to 12 ounces) per capita per week, with virtually no discrimination in the rations among consumer groups. These figures are therefore more directly comparable with the general pre-war per capita average. For 1936-1937 the total average amounted to about 450 grams per week, including industrial consumption; the figure for household consumption of sugar, including marmalade, was perhaps 280 grams. Wartime industrial consumption of sugar (for food uses) was probably slightly below the pre-war total of 170 grams per week. Total consumption of sugar for food by the civilian population in the first two years of war may be estimated at from 100 to 105 percent of the pre-war level. The corresponding estimate of the *Ernährungswissenschaftliche Forschungsstelle* is 107½ percent of the 1938 figure, or about 111 percent of the 1936-1937 base used in this report; this estimate, however, probably includes consumption by the armed forces.

Meat

The available data are much less dependable in the case of meats. A comparison for the various consumer categories reveals considerable discrepancy. At any rate,

[3] 1938 per capita consumption per week: 2,107 grams; 1939-40 average ration 2,226 + 1 percent population increase = 2,248; $\frac{(100)\ 2,248}{2,107} = 6.7$.

consumption by the single "normal consumer" was severely cut, to perhaps one-half, or at least to two-thirds of the pre-war standard. In urban families with children, consumption in the first two years of war may have ranged from two-thirds to four-fifths, on the average. Considerably larger allowances for heavy workers and extra-heavy workers raised this percentage for worker families whose male head belonged to one of the privileged categories. On the other hand, it should be noted that the declines in wartime meat consumption were greater for the higher-income groups. Meat consumption in Germany is elastic and varies directly with variations in the income level. The rations, therefore, curtailed most of all consumption by the upper income groups - the more so since these families have a smaller than average number of children (whose relative rations are above those for normal adults), while none of their adults would qualify for the extra rations allotted for more strenuous, manual work. On the other hand, the clandestine market is more accessible to the buying power of these income groups.

A weighted average civilian ration for all of the German population may be estimated to have been between two-thirds and three-fourths of pre-war meat consumption in the first two years of war.[4] The reduction in the meat ration from June 2, 1941, by roughly 20 percent for several consumer categories reduces the weighted average civilian ration to perhaps five-eighths of pre-war consumption.

The above figures, tested against the data published by the *Ernährungswissenschaftliche Forschungsstelle* for the first war year, appear to be too low. This institute estimated average consumption at 89 percent of the last pre-war year (presumably 1938). The figures of table 2, Appendix, indicate a consumption of only 76 percent of the pre-war figure (1936 and 1937). If 1938 had been taken as a base, this percentage would be only 71. There is, therefore, a large unexplained difference between the calculations made for this report and those by the *Forschungsstelle*. Our weighted average ration for the civilian population in the first two years of war would come to about two-thirds or three-fourths of the pre-war figure; or to from five-eighths to two-thirds of official 1938 consumption data. The German institute estimate for the civilian average would perhaps give 78 percent of 1938 - or about 10 percent of 1938 more than our estimates.

These discrepancies may perhaps be explained by an actual distribution of the population different from that assumed in table 2, Appendix; in such a case, more people than assumed would receive the higher rations, so that the average for the population as a whole would be higher. The discrepancies may, however, also be due to consumption of meat acquired through illicit trade outside the official ration. Although bootlegging of food so far in this war has been much less important than in the World War, a certain amount of clandestine trading is being done. It should also be noted that the *Forschungsstelle* has estimated consumption, not the average ration; in the estimates of food consumption in the World War they had also included purchases in the clandestine markets.[5]

Both factors probably fully account for the difference. On the basis of available supplies in the first two years of war, the estimate of the *Forschungsstelle*

[4] This percentage is about two-thirds, according to table 2, Appendix, but since the total pre-war consumption figures may be somewhat high, it seems likely that the true average was above two-thirds.

[5] Compare *Der Ernährungskrieg*, Walter Hahn, p. 52, Hamburg, 1939.

seems not altogether unreasonable. It might be assumed that average civilian consumption of meat in the first two years of war probably was somewhat larger than the average civilian ration estimated in table 2, Appendix. About 80 percent of the pre-war level (1936-1937) appears to be the appropriate assumption.

Fats and oils

The results of our calculations for fats and oils are summarized in table 3 of the Appendix. It appears that the average civilian ration in the first two years of war was probably between two-thirds and three-fourths of pre-war consumption. The single normal consumer certainly had a ration of less than two-thirds of his pre-war intake, while families with children were probably near the three-quarter mark. Relatively high rations in terms of pre-war consumption also appear to have been allotted to extra-heavy workers.

The estimate, according to table 3, of the average fat ration, including soldiers, is 72 percent. The comparable estimate of the *Ernährungswissenschaftliche Forschungsstelle* is 84 percent. The difference may again be explained, as in the case of meat, by purchases in the illicit market and by the possible inclusion of larger numbers of people in the privileged ration categories. Moreover, there is a consumption of fats and oils not included in the ration, but included in the pre-war data; namely, consumption by bakeries. It should be noted, however, that consumption of fats by bakeries in Germany is very small compared to the substantial consumption of this type in the United States; in wartime it is even smaller.

Considering all these factors it may be said that consumption of fats and oils by the civilian population in Germany in the first two years of the war was probably over 70 percent of the pre-war figure.

Milk and cheese

Whole milk supplies are reserved for children and for expectant and nursing mothers, certain worker categories in the chemical industries, and sick persons. Consumption of fresh milk by these consumer groups in the first two years of war was probably not much below accustomed standards, particularly in worker families. The supply to other consumers is restricted to skimmed milk. German authorities claim that the consumption of skimmed milk in 1940 was probably larger than the previous consumption of whole milk, whereas during the World War whole milk was replaced by skimmed milk to the extent of only about 5 percent.[6]

The supply of cheese to the civilian population in the first two years of war may be estimated at about two-thirds of the normal quantity; for worker families at about 80 percent; for single "normal consumers" and upper middle-class families at from 50 to 60 percent.

Eggs

The existing shortage of eggs for general consumption is considerable. Only 2 to 3 eggs per month were made available to consumers in the winter of 1940-41.

[6] Compare *Weekly Report of the German Institute for Business Research*, Nov. 30, 1940.

During the laying season, in the spring and summer of 1940, the monthly quota per urban consumer was temporarily as high as 10 to 12 eggs, and it was claimed officially that in the first 11 months of war 78 eggs per person were distributed to the urban population. In addition to these individual rations, nearly half a billion eggs, it is claimed, were furnished to hotels, boarding houses, restaurants, bakers, and manufacturers of alimentary pastes. The authorities stated that total egg consumption was hardly less than in recent pre-war years, when it was from 10 to 20 percent below that of 1927-1929. If the official statement is taken to refer to total civilian and army consumption, the reduction in civilian consumption alone may have been as much as by 20 percent of the average of recent pre-war years, when egg supplies were already limited.

STATISTICS, ESTIMATES, AND METHODS OF COMPARISON

It is natural that students of the economic statistics of fascist countries should look askance at the available official data. Comprehensive political control and propaganda in every field of life are part and parcel of the government's political philosophy, and such a situation is not conducive to the independent operation of an institution such as the statistical office. Yet it seems likely that German statistics of agricultural production and food consumption up to 1938 reflect in general the true trend of events. There have been no startling breaks in the continuity of the previous statistics of food production and consumption, and the data appear plausible in the light of general developments that have become facts of the economic history of recent years.

It should also be observed that many detailed studies of agricultural and food problems have been based on official statistics, and their results in turn have been used to determine important national policies. It is hardly likely that the authorities would have permitted statistical window-dressing for propaganda purposes at the expense of vital national interests. It has rather been their policy to discontinue altogether publication of statistics they did not wish to become known at home or abroad; the annual budget data serve as an example. Naturally, in a system where optimism is considered to be a patriotic duty economic statistics based largely on estimates, even without deliberate falsification, over long periods are apt to show the cumulative effects of an optimistic bias. A five-year period, however - 1933 to 1937 - is too short to allow such a tendency to become quantitatively important.

In view of these considerations it has been deemed admissible to use, with some exceptions and together with other material, the official statistics of aggregate consumption. Of course, these statistics have their shortcomings, which lie chiefly in the nature of calculations based upon the indirect method of ascertaining consumption on the basis of production and foreign trade. A certain amount of care is necessary in order not to confuse the various series available, but with due precaution a consistent series of consumption figures over more than 10 years prior to 1938 can be obtained from the official publications.

The discussion of individual items of food in the previous chapter is based upon the statistics, estimates, and methods of comparison described in the following paragraphs. Detailed data for the more important food groups are given in tables 1 to 3 of the Appendix.

Pre-war consumption statistics, currently published by the German Statistical Office since the early 1920's, give figures of aggregate and per capita consumption as calculated from domestic production and foreign trade. These figures are probably somewhat higher than actual household consumption, as they include all waste and loss of weight in distribution from the producer and importer to the ultimate consumer. This waste and loss in weight differs, of course, among products, and is difficult to estimate. Allowance for these differences has been made only in the case of meat, where they seem to amount to a more than negligible figure.

Statistics of total national consumption are officially claimed to take account of the movements in stocks from one year to the other. This claim is substantiated in the case of bread grains by the calculations of "annual disappearance" made for pre-war years by the Statistical Office, as well as, previously, by the *Institut für landwirtschaftliche Marktforschung.*[7] Until very recently the movement in stocks in the case of such products as meat and fats was unimportant and may well have been neglected without much distortion of actual consumption figures. At any rate, over a period of years before the middle of 1937, actual changes may be assumed to have cancelled out. The data for sugar were always based on exact consumption statistics for taxation purposes, so that the movement in stocks did not enter into their calculation. A number of improvements and corrections have been made at intervals by the Statistical Office, partly as a result of suggestions by research workers connected with other institutions and agencies. Thus, for example, the Statistical Office has for some time been publishing meat consumption data excluding the so-called slaughter fats - lard, fatbacks, and tallow - which had previously been included in the meat data. At the same time the data for preceding years were revised accordingly. More recently, meat consumption statistics for 1937 and 1938 have been revised so as to allow for higher slaughter weights of the farm-slaughtered animals.

In some cases, it is true, improvements made in the methods of estimating production and consumption, notably in collecting production returns, may cause legitimate doubts as to the comparability of statistics for later years with those for earlier periods. Such doubts may to some extent be justified; for example, in the case of milk production. In recent years, as a result of a rigid regulation of milk marketing, the share of the total milk output handled and processed in government-controlled dairy establishments has greatly increased. At the same time there has also been a large increase in the number of dairy cows under the control of milk-testing associations. Hence the returns collected in recent years may not be strictly comparable with the estimates for years prior to 1936.

Apart from the statistics of aggregate national consumption there are available the results of a detailed official inquiry into the household budgets for 1927-1928 of 2,000 families of workers, employees, and civil servants. Another inquiry covering 1937 was confined to worker households at the lower economic level. Whereas for purposes of direct comparison with wartime rations or wartime consumption the over-all official statistics of aggregate national consumption appear to be too general, giving as they do an average for the entire population, so the household budget data are too specific, representative of only certain occupational or even regional groups of the population. Neither the aggregate nor the household data are directly comparable with

[7] Compare "Die deutsche Getreidebilanz" (by N. Jasny and A. Hanau) published for the first time in the October 1931 issue of the *Blätter für landwirtschafliche Marktforschung* (Berlin).

the consumer categories specified by the wartime rations. Thus, that section of the 1927-1928 household budget study which gives data for 897 worker families not only covers people whom wartime rationing classifies as "normal consumers," but also "heavy workers," "extra-heavy workers," "long and night workers," and, of course, children in various age groups.

In view of these circumstances it has been found advisable to compare wartime rations with both the statistics of aggregate consumption and with household budget returns. For the latter the worker households of 1927-1928 have been selected as the group represented by the largest sample and representing the most important urban consumer category. Food consumption by worker families in more recent years before the outbreak of war - say 1935-1937 - is not believed to have been greatly below the 1927-1928 level. The results of the household budget inquiry of 1937 do not give satisfactory comparisons. The data published are a sample of only 350 families - all at a considerably lower economic level compared with the 1927-1928 worker families.[8] A comparison of the wartime rations with consumption by that group of worker families which formed the statistical universe of the 1937 sample, if generalized, would make the reduction in food consumption in Germany brought about by the war appear too small.

For the comparison of wartime rations with the official statistics of aggregate consumption in recent pre-war years, the distribution of pre-war consumption by the consumer groups specified for wartime rations has been roughly estimated on the basis of occupational statistics and general knowledge of, as well as scattered information on, differences in food consumption among consumer groups. The relative importance of the various consumer ration categories for the first two years of war has also been roughly estimated on the basis of general assumptions regarding the shifts in the occupational status of the population which have taken place as a result of the war. These estimates, though necessarily tentative, are less haphazard than they may at first glance seem to be. There are, after all, relatively narrow limits within which possible alternative assumptions still appear reasonable. Before making final assumptions a number of variations have been tested, and it was found that in regard to the ultimately relevant comparisons the differences obtained were of little importance.

For the comparison of wartime rations with 1927-1928 consumption by worker families as per household budget inquiry, the wartime figures have been calculated for families of exactly the same composition as to size, age groups, and sex as that of the 1927-1928 families. This calculation, moreover, was made for three family groups: the first with all adult components in the "normal-consumer" category; the second with one male member a "long and night worker," and the other adult components of the "average family" "normal consumers;" the third with one male member a "heavy worker," and the other adult components assumed to be "normal consumers." As a further check a wartime "normal consumer" family was compared with a pre-war "normal consumer" family - whose consumption was derived not from the 1927-1928 household budget data but from the estimated distribution of the officially reported aggregate national consumption.

[8] Compare *Vierteljahrshefte zur Statistik des Deutschen Reiches*, No. 1, 1937; *Wirtschaft und Statistik*, No. 4, 1939; and *Vierteljahrshefte zur Wirtschaftsforschung*, Heft 2-3, pp. 159-160, 1940-1941. The average income per household studied in 1937 was only RM 2186, which in terms of 1927-1928 buying power would be roughly RM 2600 (comparison made on the basis of cost of living index); the average income per worker household in the study for 1927-1928, on the other hand, was RM 3325, or 28 percent above the reflated average income of the families studied in 1937. The difference in the size of the average family between the two inquiries is only 2.5 percent.

PRESENT FOOD CONSUMPTION COMPARED WITH THAT OF WORLD WAR PERIOD

Present food consumption in Germany compared with that during the World War from 1916 is characterized by considerably larger aggregate food allowances and considerably more rational distribution among consumer groups. Long and night workers, heavy workers, and extra-heavy workers now also have rations considerably above those granted in the last war, and they are being made available to a much larger number of people than was then the case. The soldiers' diet is also better and more scientifically balanced than it was in 1914-1918.

Comparisons among rations are difficult to make, since there was much less uniformity and unity in the rationing system of the World War. Such comparisons are further complicated by the fact that bootlegging in the last war was considerable, whereas in this war it appears to be much less extensive, though there are indications that in the past 8 or 10 months illicit trading has increased. Actual wartime consumptionoof specified foods in the World War was therefore not as much below consumption in the present war as would appear from a mere comparison of ration data. Yet for great masses of the lower-class urban population the rations specified by the authorities were all they could get even in the last war. Frequently the rations were not fully available. This is why, in a sense, World War and present war rations may yet be legitimately compared. Furthermore, since large numbers of people are this time included in the privileged consumer categories, a comparison between "normal consumer" rations tends to understate present average rations in relation to the World War period.[9]

Rations of bread, flour, and farinaceous foods from February 1915 to June 1916 for the "normal consumer" category fluctuated between 1,500 and 1,650 grams per person per week; from April 1917 they were reduced to about 1,200 grams; and from August 1917 to August 1918 ranged from about 1,600 to 1,200 grams. The "normal" bread, flour, and cereals ration during the first two years of this war amounted to a flour equivalent of about 1,800 grams (63½ ounces) per person per week, and the bread quality is said to be far superior to that of the bread available to urban consumers in the World War.

The "normal consumer" rations of edible fats by the middle of 1916 had been reduced to 70-75 grams per person per week, whereas in the first two years of this war the ration stood unchanged at about 270 grams (9½ ounces). The German meat ration by August 1916 was down to 200 grams per week, and in 1918 ranged from 200 to 70 grams. For 21 months from the outbreak of the present war the "normal consumer" ration of meat was held at 500 grams per person per week, and from June 2, 1941, was reduced to 400 grams (14 1/8 ounces).

So far during this war potatoes have been available for human consumption in ample quantities except for short periods of transportation difficulties; during the

[9] Special studies of the War Committee for Consumer Interests analysed and published by the Statistical Office in 1917 to 1919 had for their purpose a description of levels of living in urban areas in the World War years. They were published in the *Reichs-Arbeitsblatt*, 1917, no. 2 and no. 3 (April and July 1916); in *17.Sonderheft zum Reichs-Arbeitsblatt* ("Beiträge zur Kenntnis der Lebenshaltung im dritten Kriegsjahre" for April 1917); and in *21.Sonderheft zum Reichs-Arbeitsblatt* ("Beiträge zur Kenntnis der Lebenshaltung im vierten Kreigsjahre" for April 1918). These studies, based upon relatively small samples, in many respects are of considerable interest, but appear to be gross overstatements of wartime consumption if compared with the German ration data quoted by Skalweit, Briefs, Beveridge, and Starling. None of these studies appears to give any reference as to how the extraordinary differences compared with the rations are to be explained.

World War a scarcity of potatoes for urban consumers became evident as early as the fall of 1915, and a calamitous shortage occurred during the severe "potato-killing" winter of 1916-1917, following the loss by the Central Powers of eastern Galicia.

TABLE 2.—*Germany and Austria: Urban "normal consumer" rations of specified foods, 1916, 1917, and 1941 [per adult per week]*[1]

FOODSTUFF	1916[2]		1917[2]		1941[3]
	GERMANY	AUSTRIA	GERMANY	AUSTRIA	GERMANY (INCLUDING AUSTRIA)
Bread, flour, and cereals:	*Grams*	*Grams*	*Grams*	*Grams*	*Grams*
in terms of flour	1,400–1,800	1,400	1,200–1,550	1,200–1,400	1,763–1,838
Potatoes	2,500–3,500	1,500	2,850–3,200	500–1,500	Not rationed[4]
Sugar	150–180	300	150–170	200	225
Meat	250	–	250–135	–	[5] 400
Fats and oils	60–90	[6] 120	50–90	100	270

[1] Figures in grams, of which 28.35 = 1 ounce.

[2] Data summarized from table 4, Appendix.

[3] Up to October 1941.

[4] Supplies were mostly ample, and probably considerably above 1916 and 1917 rations. Temporary local shortages of potatoes were reported in July 1941.

[5] 500 grams before June 2, 1941.

[6] Not fully available.

CONCLUSION

Aggregate food consumption by the German population during several years prior to 1939 was doubtless below what it would have been without regulation, but it was probably not substantially below earlier periods of high economic activity.

Food consumption in the first two years of war in Germany, Austria, and the Sudeten region was considerably reduced compared with pre-war normal consumption. The restrictions imposed, however, do not appear to have been so far-reaching as to affect in measurable degree the physical condition and working efficiency of the population at large. In many respects the food situation has been considerably better than in the comparable period of the World War.

Considerable differences exist in the wartime restrictions of food consumption by consumer groups. There is no doubt that the rationing system has been shaped with a view to favoring large-size families and, above all, those groups of the population which most directly sustain the military, industrial, and agricultural war effort. The so-called "normal consumer" - the common city dweller in nonmanual or light manual work - has seen his food standard considerably curtailed. Particularly the upper middle class, with a higher normal consumption of meat, fruit, and vegetables, had to reduce its food intake extensively. In regard to families in still higher income brackets the situation has been alleviated by the availability, at very high prices, of a variety of fancy-type foods that still seem to be on the market. For a number of consumer groups a certain amount of illicit trading has added generally to the

rations of food legally allowed, though this clandestine market has been less important than it was in the World War. In the past 8 or 10 months, it is said, illicit trading has increased, as it increased in the later years of the last war. Laborers doing a heavier type of manual work, children, and probably the rural population in general have relatively larger food allowances. Soldiers appear to be very well fed.

Rationing measures have been characterized by long-range planning. Rations are being announced for four-week periods several weeks in advance. For 21 months the principal food rations remained virtually unchanged. The first significant reduction was a cut in meat from June 2, 1941, and this reduction in all probability was not an expression of an immediate emergency but of a gradual reduction in current production and necessary redistribution of allowances. Prior to the invasion of the Soviet Union there was a substantial increase in the armed forces, the industrial war effort was further stepped up, and additional numbers of people were drawn into more strenuous occupations. These measures added to the numbers of consumers entitled to larger food rations. At the same time, the current output of meat experienced a reduction both within Germany and in the occupied countries from which supplies had been drawn in relatively large quantities since the middle of 1940.

Wartime consumption of bread, flour, and other farinaceous foods by the civilian population is hardly below its pre-war level. In worker families it is probably even above the pre-war level. Consumption of sugar seems to be slightly above the pre-war figure; of potatoes, considerably above.

TABLE 3.—*Germany: Estimates of relative food consumption, 1939-1941, as percentage of recent pre-war averages*[1]

FOODSTUFF	AVERAGE FOR CIVILIAN POPULATION	SINGLE "NORMAL CONSUMER"	WORKER FAMILIES	UPPER MIDDLE-CLASS FAMILIES
	Percent	*Percent*	*Percent*	*Percent*
Bread, flour, and farinaceous food	100	90	110	100
Potatoes	115	120	120	110
Sugar	100–105	100	105	95
Meat and meat offals	[2] 80	[2] 65	[2] 80	55
Fats and oils	70	65	75	70
Cheese	70	50	80	60
Eggs[3]	65	50	70	65
Vegetables	First war year, below 100; second war year, above 100	–	–	–
Fruit	Considerably below 100	–	–	Much below 100

[1] It should be noted that the consumer groups given are not complete; therefore no conclusion should be drawn as to the weight of each group in determining the total civilian average.

[2] The reduction in the meat ration from June 2, 1941, may have reduced the average for the civilian population from that date to about two-thirds; for the single "normal consumer" to 50 percent; and for worker families to below 75 percent.

[3] In percent of normal pre-war years.

TABLE 4.—*Germany: Composition of food diet and energy value of wartime food consumption compared with that of pre-war period*

FOODSTUFF	PRE-WAR PERIOD 1935-1936[1]	1939-1941[2] (CIVILIAN PER CAPITA CONSUMPTION)		
	PERCENT OF TOTAL CALORIES CONSUMED	PERCENTAGE OF PRE-WAR PERIOD	INDEX OF CALORIES CONSUMED	PERCENTAGE OF TOTAL CALORIES CONSUMED
	Percent	*Percent*	*Index*	*Percent*
Bread	30	100	30	34
Potatoes	13	115	15	17
Legumes	1	80	0.8	1
Sugar	8	105	8.4	9
Vegetables, fruit, tropical fruit, nuts	3	80	2.4	3
Beverages containing alcohol	3	60	1.8	2
Fats and oils	19	70	13.3	15
Fresh milk	8	80	6.4	7
Cheese	1	70	0.7	1
Meat	9	80	7.2	8
Fish	1	50	0.5	1
Eggs	1	65	0.6	1
Other foodstuffs	3	50	1.5	1
Total	100	88.6[3]	88.6[4]	100

[1] According to H. von der Decken's estimates in *Berichte über Landwirtschaft,* 138.Sonderheft, p. 70, Berlin, 1938.

[2] Estimated by the Office of Foreign Agricultural Relations.

[3] Weighted on a calorie basis.

[4] Representing wartime consumption as percent of pre-war figure, on a calorie basis.

Wartime civilian consumption of meat up to June 2, 1941, may have averaged about four-fifths of the pre-war standard; since the cut on June 2, which amounted to 20 percent for a number of consumer categories but was partly offset by an increase in numbers of consumers in the heavy worker groups, the civilian average may have been at about two-thirds. The single "normal consumer" will now have hardly more than 50 percent of his pre-war meat supply; worker families may average below 75 percent.

Average quantities of fats and oils supplied to civilians in the first two years of war were probably about 70 percent of the pre-war level. Worker families' consumption of green vegetables in the first year of war was presumably below pre-war consumption, and in the second war year measurably above. Fruit supplies continue considerably below normal, largely because of small domestic crops.

Fresh milk consumption by children as well as expectant and nursing mothers in the first two years of war was probably not much below accustomed standards, particularly in worker families. The supply for ordinary adults was restricted to skimmed milk. Average civilian consumption of cheese is probably not more than two-thirds of normal, and consumption by worker families about four-fifths.

Consumption of eggs appears to have declined considerably, compared with a normal standard. In recent pre-war years over-all national consumption was from 10 to 20 percent below a normal peacetime level, and for the civilian population a further reduction of at least 20 percent seems to have occurred since the outbreak of war, lowering current supplies to the civilian population to perhaps two-thirds of a normal peacetime standard. For some consumer groups restriction was even more severe.

Thus it appears that the wartime diet of the German people, though characterized by a fairly ample supply of carbohydrates, is considerably reduced with respect to fats and proteins. A certain deficiency in vitamins and mineral salts is recognized by the authorities, and a beginning has been made in supplying synthetic vitamin C to soldiers, children, and certain categories of workers. Margarine is being fortified by the addition of vitamin A to make it physiologically equivalent to butter. Bread flour, which is being milled to 85 percent extraction, supplies vitamin B_1 in quantity.

Consumption of individual foods in the various consumer groups during the first two years of war may be estimated to have ranged from 50 to 120 percent of the pre-war figures, with an average total food consumption by the civilian population at nearly 90 percent of the pre-war calorie value. For large and important groups of the population the calorie value of total consumption of rationed and unrationed foods probably does not differ much from their pre-war standard. As a result of the described shifts in the composition of the diet, however, the proportions of fats and proteins and of food vitamins and mineral salts are generally reduced. In connection with this reduction in supplies it is well to remember that the numerous strains of war increase rather than reduce the physiological requirements of the human body.

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STATISTICAL APPENDIX

Weekly consumption figures in the following tables are given in units of the original statistics and rations; namely grams, of which 28.35 equal 1 ounce.

In table 1 bread and other bakery goods were converted into flour at the ratio 1.3:1. Cereals, alimentary pastes, etc., were considered equivalent to flour. Legumes such as peas, beans, and lentils were not included in the bread and flour items.

Consumption data per "average worker family" in tables 1 to 3 are for a worker family constituted as per 1927-1928 household budget inquiry of the German Statistical Office (*Einzelschriften zur Statistik des Deutschen Reiches*, No. 22, v. I-II, Berlin 1932). According to the age and sex distributions given in these statistics (pp. 13-16) it has been assumed that the average worker family is composed of 1.24 men, 1.16 women, 0.3 child up to 3 years old, 0.4 child 3 to 6 years old, 0.6 child 6 to 10 years old, and 0.5 child 10 to 14 years old; giving 2.4 adults and 1.8 children, or 4.2 persons to an average family. The wartime rations of a family thus constituted are compared with the average worker family consumption as per household budget inquiry of 1927-1928.

Consumption data per "average normal consumer family" in tables 1 to 3 are for a family constituted as indicated above. Pre-war consumption figures for this description, however, were not calculated from household budgets, but from pre-war data for "normal consumers" and children in the "estimated consumption" columns. Corresponding calculations from those columns for families whose male head may be a "long or night worker" or a "heavy worker" proved impracticable. In the first place, the estimates of pre-war consumption by "long and night workers" are included in the "normal consumer" estimates. Secondly, the estimates of pre-war "heavy worker" consumption, particularly of fats and oils, are somewhat doubtful. Moreover, many workers who now receive heavy worker rations did not have a heavy worker diet before the outbreak of war, since large numbers of operatives have been drawn into more strenuous occupations during the past two or three years. Although it is true that the extra rations for heavy workers are partly due to their higher physiological needs, they are also partly a type of social compensation, and to this extent the comparison should not be with a heavy worker diet before the war. In this connection it may be noted that it has rightly not occurred to research workers in this field to compare food consumption data before and after the World War by making first an allowance for differences in physiological needs because of the undeniable differences in working hours before 1914 and after 1920.

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TABLE 1.—*Germany (1937 boundaries): Weekly consumption of bread, flour, and other farinaceous foods, pre-war period and 1939-1941*[1] *[Expressed in terms of flour]*

CONSUMER GROUP	RECENT PRE-WAR YEARS		1939-1941				
	PERCENTAGE OF POPULATION[2]	ESTIMATED CONSUMPTION[3]	PERCENTAGE OF POPULATION[4]	RATIONS: SEPT.-JULY 1939-1940	RATIONS: FROM AUGUST 1940	SEPT.-JULY 1939-1940 RATIONS AS % OF PRE-WAR CONSUMPTION	RATIONS FROM AUGUST 1940 AS % OF PRE-WAR CONSUMPTION
	Percent	*Grams*	*Percent*	*Grams*	*Grams*	*Percent*	*Percent*
Normal consumers	54.10	1,954	42.6	1,950[4]	1,800[5]	100	92
Farmers and farm workers	13.22	3,675[6]	10.6	2,750[4]	2,600[4]	75	71
Heavy workers	6.81	3,025[6]	9.2	2,960	2,850	98	94
Extra-heavy workers	1.15	3,240	2.1	3,710	3,600	115	111
Long or night workers	(7)	(7)	7.1	2,360[4]	2,250[4]	-	-
Soldiers	3.00	3,800[8]	7.1	4,000[4]	4,000[4]	105	105
Children:[9]							
0-3 years	5.23	782	5.1	1,100	1,100	141	141
3-6 years	4.23	977	4.1	1,100	1,100	113	113
6-10 years	5.90	1,368	5.8	1,390	1,390	102	102
10-14 years	6.36	1,759	6.3	1,910[11]	2,060[12]	109[13]	117[13]
Weighted averages	100.00	2,200[10]	100.0	2,226[11]	2,160[11]	101[13]	98[13]
Excluding soldiers	97.00	2,150	92.9	2,090	2,020	97	94
Average worker family	-	6,962	-	7,239[14]	6,954[14]	104	100
				7,649[15]	7,404[15]	110	106
				8,249[16]	8,004[16]	118	115
Average "normal consumer" family	-	7,017[14]	-	7,239[14]	6,954[14]	103	99

[1] See also introductory note, p. 437.

[2] Estimated on the basis of population and occupational statistics.

[3] Average 1936 and 1937, according to official total consumption statistics. Data for preceding years did not differ greatly.

[4] Roughly estimated by the Office of Foreign Agricultural Relations.

[5] 2,060 grams for young people from 14 to 20 years old.

[6] These estimates have been made not wholly without reference to the data given by W. Ziegelmayer in the *Zeitschrift für Volksernährung*, July 20, 1937. The present writer, however, has some doubts as to the representative character of Ziegelmayer's sample of the food consumption by heavy workers. The study had been confined to the Ruhr district. The average data for "miners" *(Grubenarbeiter)*, sometimes assumed as representing the peacetime consumption by extra-heavy workers, were based on from 20 to 47 cases only.

[7] Included in "normal consumers."

[8] As per *Zeitschrift für Volksernährung*, Sept. 20, 1938.

[9] Pre-war consumption by children, according to age groups, assumed o have been 40, 50, 70, and 90 percent, respectively, of "normal" adult's consumption.

[10] Average of official total consumption statistics, per capita, for 1936 and 1937, plus an estimated amount for rice, groats, and other *Nährmittel* with a grain base: 2,110 + 90 = 2,200.

[11] There is a flour supplement for South Germany of 187.5 grams per week; it is available to about 20 percent of the total civilian population of the Old Reich. The supplement increases the average civilian ration by about 2 percent; the total average ration (including soldiers) by about 1½ percent.

[12] This average takes into consideration the increased ration of 2,060 grams granted from August 1940 to young people from 14-20 years old; see also footnote 5. Ignoring this special ration, the weighted average would be 2,136.—See also footnote 11.

[13] See also footnote 11.

[14] Adult male components of family normal consumers; adult female components normal consumers.

[15] One adult male in family long and night worker; remaining adult male component normal consumer; adult female component normal consumer.

[16] One adult male in family heavy worker; remaining adult male component normal consumer; adult female component normal consumer.

TABLE 2.—*Germany (1937 boundaries): Weekly consumption of meats,*[1] *pre-war period and 1939-1941*

CONSUMER GROUP	RECENT PRE-WAR YEARS				1939-1941				
	PERCENTAGE OF POPULATION[3]	ESTIMATED CONSUMPTION[2]			PERCENTAGE OF POPULATION[6]	RATIONS SEPT. 1939 - MAY 1941		RATIONS FROM JUNE 2, 1941	
		UNADJUSTED	ADJUSTED[4]	WASTE DEDUCTED[5]		AMOUNT	PERCENT OF ESTIMATED PRE-WAR CONSUMPTION	AMOUNT	PERCENT OF ESTIMATED PRE-WAR CONSUMPTION
	Percent	*Grams*	*Grams*	*Grams*	*Percent*	*Grams*	*Percent*	*Grams*	*Percent*
Normal consumers...	54.10	992	1,037	938	42.6	500	53	400	43
Farmers, farm workers	13.22	688	718	650 [7]	10.6	560	86	360	55
Heavy workers	6.81	1,270	1,326	1,200 [7]	9.2	1,000 [8]	83	800	67
Extra-heavy workers	1.15	1,481	1,547	1,400 [7]	2.1	1,200	86	1,000	71
Long or night workers	(8)	-	-	(8) [9]	7.1	600 [6]	-	600 [6]	-
Soldiers	3.00	1,270	1,326	1,200 [9]	7.1	1,800 [6]	150	1,800 [6]	150
Children:[10]									
0-3 years	5.23	199	208	188	5.1	250	133	250	133
3-6 years	4.23	397	414	375	4.1	250	67	250	67
6-10 years	5.90	695	726	657	5.8	500	76	400	61
10-14 years	6.36	893 [11]	933 [12]	844 [13]	6.3	500	59	400 [14]	47 [15]
Weighted averages	100.00	894	934	845	100.0	643	76	545 [14]	64
Excl. soldiers ..	97.00	882	922	834 [16]	92.9	555 [17]	67	450 [17]	54
Average worker family	-	-	-	2,760		1,925 [18]	70	1,575 [18]	57
						2,025 [19]	73	1,775 [19]	64
						2,425	88	1,975	72
Average "normal consumer" family	-	-	-	3,273		1,925 [17]	59	1,575	48

[1] Including offals such as liver, heart, kidney, etc. - See also introductory note, p. 437.

[2] Average 1936 and 1937, according to official total consumption statistics. Data for preceding years did not differ greatly.

[3] Estimated on the basis of population and occupational statistics.

[4] Adjusted for consumption of fats in sausages and other charcuteries which the household statistics (and rations) count as meat. Corresponding - inverse - adjustment was made in the statistics on fats and oils (table 3) where details of the assumptions made are given. The adjustment amounts to an average of 40 grams per capita per week.

[5] Adjustments made for waste and loss of weight in distribution and processing (10 percent of unadjusted weight).

[6] Roughly estimated by the Office of Foreign Agricultural Relations.

[7] Estimates based on data given by W. Ziegelmayer in *Zeitschrift für Volksernährung*, July 20, 1937, with adjustments.

[8] Included in "normal consumer" category.

[9] As per *Zeitschrift für Volksernährung*, Sept. 20, 1938, and *Militärwochenblatt* 1938.

[10] Pre-war consumption by children, according to age groups, assumed to have been 20, 40, 70 and 90 percent, respectively, of "normal" adult's consumption.

[11] Official per capita average for 1936 and 1937 of 44⅘ kilograms per year. Data for preceding years did not differ greatly.

[12] Figure mentioned in footnote 11 adjusted as per footnote 4.

[13] Figure mentioned in footnote 11 adjusted as per footnotes 4 and 5.

[14] If, because of the reported and doubtless effected increase in the armed forces since the early part of 1941, a different percentage distribution for the population is assumed, the weighted average of the rations will change. Thus, if the percentage of "soldiers" is raised to 9 percent, and that of "normal consumers" and "farmers" reduced to 41 and 10.3 percent, respectively, the weighted average ration increases from 545 to 572 grams per week; the weighted average, excluding "soldiers," remains unchanged at 450 grams.

[15] Under the assumptions of footnote 14: 70 percent.

[16] Exclusive of poultry and game; if these are included, the figure would be 2,820.

[17], [18], and [19]. See footnotes 14, 15, and 16, respectively, table 1, p. 438.

TABLE 3.—*Germany (1937 boundaries): Weekly consumption of fats and oils,*[1] *pre-war period and 1939-1941*

CONSUMER GROUP	RECENT PRE-WAR YEARS			1939-1941		
	PERCENTAGE OF POPULATION	ESTIMATED CONSUMPTION[2]		PERCENTAGE OF POPULATION	RATIONS	RATIONS AS PERCENT OF ADJUSTED ESTIMATES OF PRE-WAR CONSUMPTION
		UNADJUSTED	ADJUSTED[3]			
	Percent	*Grams*	*Grams*	*Percent*	*Grams*	*Percent*
Normal consumers	54.10	466	428	42.6	268 [4]	63
Farmers and farm workers	13.22	815 [5]	750 [5] [7]	10.6	500 [4]	67
Heavy workers	6.81	815 [5]	750 [7]	9.2	394 [6]	53
Extra-heavy workers	1.15	924	850 [7]	2.1	738	87
Long or night workers	(8)	(8)	(8) [9]	7.1	288	-
Soldiers	3.00	565	520 [9]	7.1	600 [4]	115
Children:[10]						
0-3 years	5.23	140	129	5.1	125	97
3-6 years	4.23	233	214	4.1	188	88
6-10 years	5.90	326	300	5.8	259	86
10-14 years	6.36	326	300	6.3	259	86
Weighted averages	100.00	500 [11]	460 [12]	100.0	332	72
Excluding soldiers	97.00	500	458	92.9	307	67
Average worker family	-	-	1,410	-	1,040 [13]	74
					1,060 [14]	75
					1,167 [15]	83
Average "normal consumer" family	-	-	1,482 [13]	-	1,040 [13]	70

[1] See introductory note, p. 437.

[2] Average 1937 and 1938, according to official statistics of total national consumption.. The average for 1936 and 1937 was about the same.

[3] Adjustment was made to take account of fats (lard and other hog fat, as well as tallow) in sausages and other charcuteries. Official total consumption statistics include these quantities of fat in fat consumption, while household budget statistics (and rations) include such fats under meat. Corresponding - inverse - adjustment was made in the meat statistics. For purposes of calculation it was postulated that 30 percent of the pre-war per capita consumption of meat was in the form of sausages and other charcuteries, and that 15 percent of this 30 percent was fat. This gives about 40 grams per capita per week, and the adjustment was made accordingly. No attempt has been made to allow for differences in the relative share of sausages in total meat consumption by consumer categories; for example, adults and children. The resulting inaccuracies are slight.

[4] Estimated by Office of Foreign Agricultural Relations.

[5] This estimate is probably too high, but has been retained in view of the data published by W. Ziegelmayer in the *Zeitschrift für Volksernährung*, July 20, 1937.

[6] Very doubtful figure. See also footnote 5.

[7] Estimate based on data given by W. Ziegelmayer in *Zeitschrift für Volksernährung*, July 20, 1937, with adjustments.

[8] Included in "normal consumers."

[9] As per *Zeitschrift für Volksernährung*, Sept. 20, 1938.

[10] Pre-war consumption by children, according to age groups, assumed to have been 30, 50, 70 and 70 percent, respectively, of "normal" adult's consumption.

[11] This is the official per capita average for 1937 and 1938 of 26 kilograms per year. Data for immediately preceding years did not differ greatly from this figure.

[12] See footnote 11; figure adjusted as per footnote 3.

[13], [14], and [15] - See footnotes 14, 15, and 16, respectively, table 1, p. 438.

TABLE 4.—*Germany and Austria: Weekly rations of specified foods during the World War, 1914-1918*

AREA OR CITY	BREAD, FLOUR, AND CEREALS IN TERMS OF FLOUR	POTATOES	SUGAR	MEAT	FATS AND OILS
	Grams	*Grams*	*Grams*	*Grams*	*Grams*
Austria: urban "normal consumers"[1]:					
1915	1,400	-	-	-	-[2]
1916	1,400	-	300	-	120[2]
1917	-	1,500	200	-	120[2]
1918	1,150	1,500-500	175	200-125[2]	60-40
Austria: "heavy workers"[1]:					
1915	2,100	-	-	-	-[2]
1916	1,900	-	380	-	150[2]
1917	-	1,500	-	-	120[2]
1918	1,600	1,500-500	350	200-125[2]	60
Reich rations[3] Oct.-Jan. 1915-1916:					
Normal consumer	1,575	3,500[4]	-	-	-
Self supplier	2,100	5,250[4]	-	-	-
Young people	1,625	-	-	-	-
Reich rations[3] Feb. 1, 1916-Apr. 14, 1917:					
Normal consumer	1,400	-	-	-	-
Self supplier	2,100	-	-	-	-
Young people	1,450	-	-	-	-
German cities with population over 100,000, July-Dec. 1916[3].	-	-	-	250[5]	66-84[6]
German urban rations,[7] summer 1918	1,120[8]	-	-	135	50
Bonn[9] average ration, Nov. 1916-May 1917[10]	1,800	2,850	166	325	62
Hamburg, Oct.-Nov. 1917[11]:					
Normal consumer	1,550	3,200	150	250	90
Ordinary manual worker	2,150	3,200	150	250	90
Heavy worker	2,600	4,250	150	350	130
Berlin, autumn 1916[9]	1,550	2,500	182	250	80
Berlin, Nov. 1918[9]	1,625	3,660	169	150	65

[1] According to H. Löwenfeld-Russ, *Die Regelung der Volksernährung im Kriege* (Economic and Social History of the World War, Austrian and Hungarian Series) pp. 327-339, Vienna and New Haven, 1926.

[2] Not fully available.

[3] According to August Skalweit, *Die deutsche Kriegsernährungswirtschaft* (Economic and Social History of the World War, German Series), Stuttgart and New Haven, 1927.

[4] Spring 1916.

[5] Children's ration was half this amount.

[6] From 84 in July to 66 in November and 69 in December, 1916.

[7] According to data quoted by Goetz Briefs, "Kriegswirtschaftslehre und Kriegswirtschaftspolitik," *Handwörterbuch der Staatswissenschaften*, v. V, p. 1009, Jena, 1923.

[8] After the harvest 1,400 grams, according to August Skalweit, *op. cit.*, p. 211. By 1917 a considerable deterioration in the quality of the bread had taken place. In 1918 bread contained bran and other indigestible ingredients.

[9] As per *Report on Food Conditions in Germany*, by Ernest H. Starling, with Memoranda by A. P. McDougall and Statistics by C. W. Guillebaud, London, 1919.

[10] The food that could be bought outside the rations was limited almost entirely to vegetables and a little fish. It was estimated to have amounted to from 2 to 5 percent of the nutrients obtained from the rations. (According to source given in footnote 9.)

[11] According to *Hamburgischer Korrespondent*, Oct. 26 and Nov. 11, 1917, compared with intermediate and subsequent issues, as quoted in Sir William H. Beveridge's *British Food Control*, p. 194, footnote and appendix pp. 388-391, London and New Haven, 1928. The figures given in pounds and ounces have been reconverted into grams. The normal rations applied to all persons of 6 years and over not graded in the higher classes.

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